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FARMING NEW LAND
IN THE
YAZOO-MISSISSIPPI DELTA

PROBLEMS OF SMALL, FAMILY-SIZED FARMS IN THE BACKWATER AREA

by

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LIST OF TABLES

Table No. Page

1. New land purchases, prices, and payment terms, by type of vendor 7
2. Labor and materials used per acre for clearing land, first 3 years of cultivation 8
3. Labor and cash used to clear new land 9
4. Usual farm organization and income on new-land farm at various stages of development 10
5. Cash available from farm income for family living at various stages of development of typical one-mule new-land farm 12
6. Frequency, dates, and duration of floods 15
7. Total flood damages and income reduction 17
8. Organizations of family farms 21
9. Summary of income and expenses on family farms 22
10. Net cash income adjusted for backwater damages 26
11. Suitability of land for various farming systems and number of families that would be involved under each 34
12. Normal yields of specified crops by soils groups 37
13. Damages to farm improvements, equipment, supplies, and cost of evacuation, resulting from floods, per acre of cropland 37
14. Average additional expenditures per acre of cotton and corn, required because of floods, family farms 38
15. Reduction in yield per acre of cotton and corn, due to delayed planting 38
16. Per acre reduction in net value of cotton and corn resulting from delayed planting, family farms 39
17. Number and value of buildings, livestock, and machinery items on various family farm organizations 40
18. Usual amounts of seed and fertilizer used for various crops 41
19. Annual feed requirements of livestock 41
20. Operating and maintenance requirements for tractor 42
21. Operating and maintenance data for truck 42
22. Assumed prices of products sold 43
23. Assumed current and overhead expenses, family farms 44
24. Usual yearly perquisites, family farms 45
25. Hours of man labor and power used per acre in producing various crops, family farms 45
26. Usual distribution, by months, of labor and power used per acre in producing various crops, family farms 46

CONTENTS

Page

Introduction 1
Soils in the area 1
New-land settlement 5
  Considerations in acquisition of land 5
  Limitations in developing new farms 5
Influence of backwater floods on farming systems
  and incomes 14
  Flood frequency and duration 14
  Flood damages 14
Analysis of family-farm organizations and incomes 19
  Comparison of incomes 20
  Suitability of Backwater Area for family-sized farms 25
Comparison between family farms and plantations 28
Suggestions for improving the economic status of
  small-farm operators settling new land 31
Possibilities of increased farm population on
  undeveloped land 33
Appendix 37

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PREFACE

The Yazoo Backwater Area occupies slightly more than a million acres in the Southern portion of the Yazoo-Mississippi Delta, and is so called because it has been subject to inundation by flood waters of the Mississippi River which back up through the Yazoo River channel. Much of this land is still not cleared and therefore not in crop production, chiefly because of these backwater floods. Most of the marketable timber has been removed which leaves the area in what is referred to as cut-over land.

River cut-offs and other channel and levee improvements have now greatly reduced the danger from floods. Because of this and the pressure of population in nearby sections, many farm families in search of increased opportunities are moving into the backwater area and clearing land for farms.

This report contains a description of the area and an analysis of its suitability for farming, a consideration of some of the problems confronting new-land settlers, and suggestions for improving the economic condition of new settlers. Major emphasis has been placed upon the operation of family-sized farms of which 5,000 to 6,000 can be developed in this new area.

This information should be useful to present and prospective settlers in the area through the Governmental agencies that are interested in and are guiding this new-land settlement. This report has been developed from a comprehensive farm-management report submitted as one phase of an over-all study of the Yazoo Backwater Area.

FARMING NEW LAND IN THE YAZOO-MISSISSIPPI DELTA

Problems of Small, Family-Sized Farms in the Backwater Area

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INTRODUCTION

Approximately 700,000 acres of delta land in the Yazoo Backwater Area is still undeveloped for agricultural use. This area is a considerable part of the cut-over land in the Mississippi Alluvial Valley still available for settlement. Numerous families who have little in the way of capital reserves are working hard to gain some security as owners of 40- and 80-acre farms on this land.

Many of these settlers have recently set up new farms. Records of the Agricultural Adjustment Administration show that 874 new farms were established during the period 1934-40. Several reasons for this influx are apparent. Floods, whose frequency and severity have made farming extremely hazardous, have become less damaging, as engineers have installed cut-offs along the Mississippi River. Then in the older adjoining farming areas, workers have been more numerous than jobs partly as a result of reduction in cotton acreage and the increase in the use of mechanical equipment. Many of these workers and their families have moved to undeveloped areas in the Delta.

What farming problems face these new settlers? How many more can make farms that will yield a living in the area? What flood damage should be expected? What other conditions in the area affect the incomes of farmers, particularly those on smaller farms? How can the adverse effects be kept down? Such questions, vital to the future of the area, give meaning to the description and analysis in this report.

SOILS IN THE AREA

The Yazoo Backwater Area comprises the southern portion of the Delta flood plain lying east of the Mississippi River and includes a part or all of the following Mississippi counties: Issaquena, Sharkey, Washington, Warren, Yazoo, Sunflower, and Humphreys. This area has a level topography, numerous sloughs and swampy cut-over sections, and an elevation ranging from 85 to 107 feet. The soils are variable. For the purpose of the study on which this report is based, the soils were delineated by technicians of the Bureau of Plant Industry into seven groups on the basis of productivity, physical characteristics, and crop adaptation. Each of these groups contains several soil types,

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1/ Now with the Farm Security Administration.

but is dominated by soils that are comparable in their physical and productive qualities. The seven groups are referred to in this report by letters, A to G. (See fig. 1.)

Most of the soils in groups A, B, and C are the light-textured, well-drained soils, which are confined primarily to the slightly elevated areas paralleling the courses of streams. These soils in general produce good yields of several crops and are already developed for agriculture. The acid reaction of C soils and their tendency to become more compact after the depletion of organic matter make the soils in this group less desirable for growing corn and alfalfa than the A and B soils. (For crop-yield data by soils areas see table 12.)

The D group has heavy compact clay soils that are ordinarily well-supplied with organic matter when they are first cleared. This good supply of organic matter tends to offset undesirable conditions, such as inherently poor aeration, internal drainage, and unstable capacity for furnishing moisture to plants. The D soils are more difficult to till than the light-textured soils, and this difficulty increases with the depletion of organic matter. As these soils continue in cultivation, the fine clay particles pack more closely together, making it increasingly difficult for plants to get moisture. In time, there is usually a marked decrease in yields, as well as an increase in the variability of yields, but the rapidity and the extent of the decline depend to a considerable degree on management.

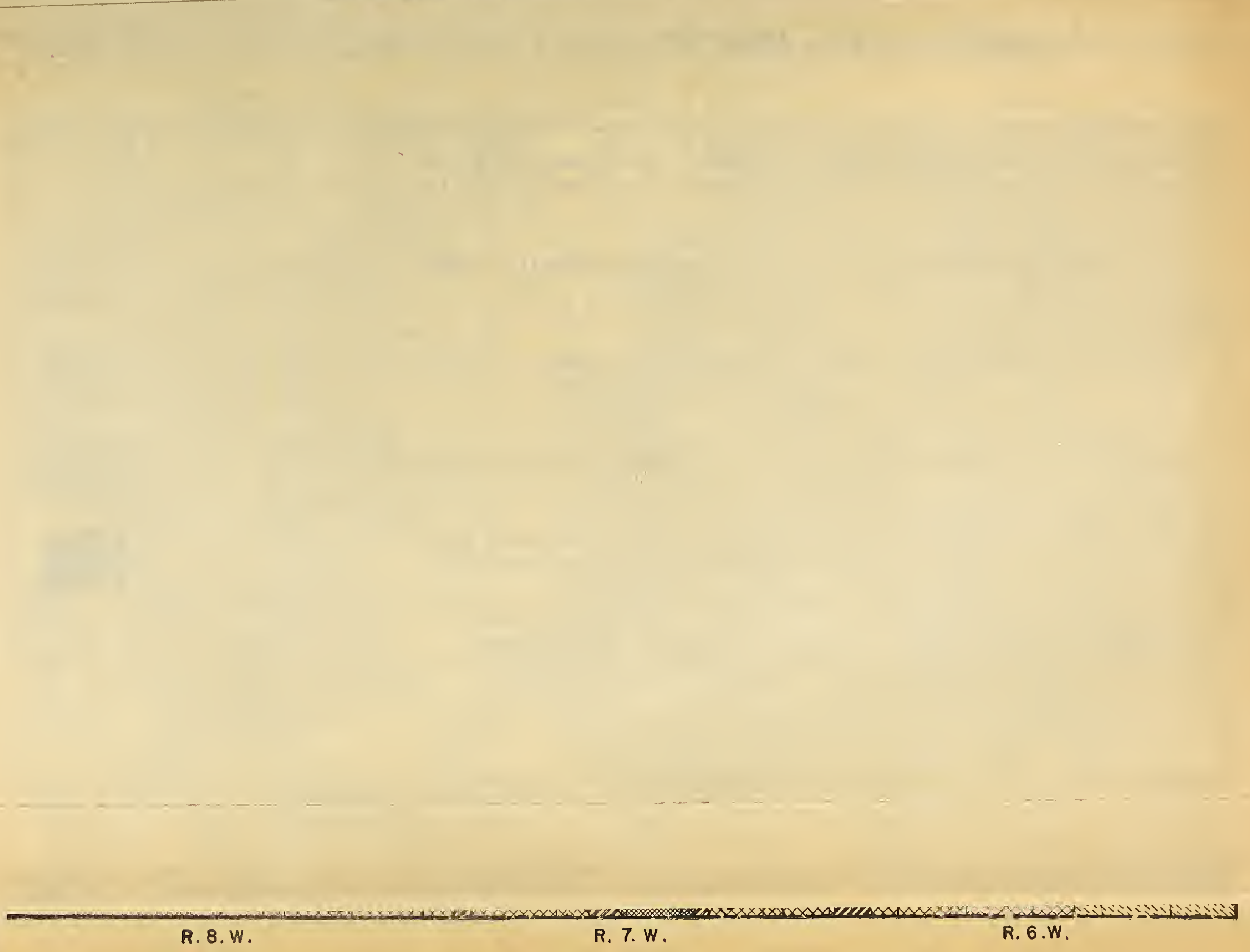
The D soils produce good yields of corn during the early years of cultivation, but soon may become poorly adapted to corn production. The adverse properties of D soils do not affect cotton production so much, because cotton is adapted to a wider range of moisture conditions. D soils produce good yields of oats, soybeans, and alfalfa. The high mineral content and alkaline or only slightly acid reaction make D soils well adapted to leguminous crops.

The E soils are rather similar to D soils, but are less productive, less durable and they are rather acid. Furthermore, virgin E soils are somewhat lower in organic matter and mineral bases; the organic material varies in depth from 4 to 10 inches on virgin E soils, allowing a wide variation in their durability. But even after these soils become submarginal for cotton production, the yield of oats and soybeans remains relatively high.

The E soils are even poorer for corn growing than D soils. Yields of both corn and cotton are fairly high on newly cultivated E soils but they decline rapidly as organic matter is depleted. Yields of oats compare favorably with those on all other soils groups. Because of their acidity, E soils are not suited to alfalfa, and produce lower yields of soybeans than the other soils.

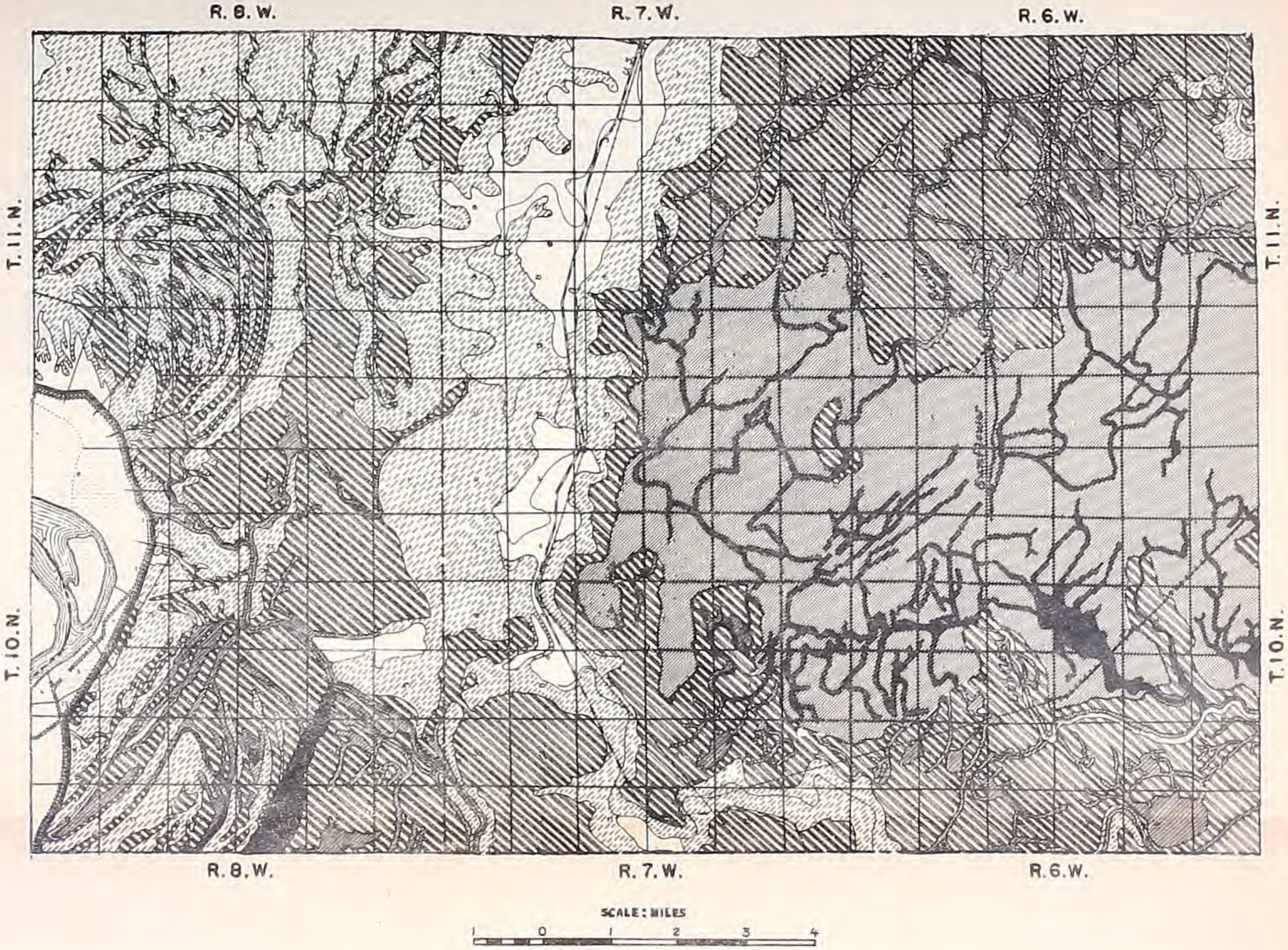
The decrease of yields, through time, on D and E soils and the attendant undesirable changes in physical structure, which result in higher operating costs, make it desirable to consider both the new and old soils in these groups. (New soils are those which have been in cultivation 15 years or less; old soils are those in cultivation more than 15 years.) Such a separation is made in budgetary analysis. (See page 21 .)

FREQUENCY OF



FREQUENCY OF FLOODS

SECTION OF MISSISSIPPI BACKWATER AREAS, YAZOO SEGMENT



FLOOD FREQUENCY GROUPS

CROSS HATCHING	CONTOUR	FREQUENCY OF FLOODING SOMETIME DURING THE YEAR	FREQUENCY OF FLOODING DURING CROPPING SEASON
■	85' OR BELOW	AT LEAST ONCE PER 1.3 YEARS OR MORE OFTEN BELOW 85' CONTOUR.	ONCE EVERY 1.6 YEARS OR MORE OFTEN.
▒	85'–90'	ONCE IN 1.3 YEARS AT 85' CONTOUR	ONCE IN 1.6 YEARS AT 85' CONTOUR.
▨	90'–95'	ONCE IN 1.8 YEARS AT 90' CONTOUR	ONCE IN 2.5 YEARS AT 90' CONTOUR.
░	95'–100'	ONCE IN 5 YEARS AT 95' CONTOUR	ONCE IN 8 YEARS AT 95' CONTOUR.
□	OVER 100'	(ONCE IN 15 YEARS AT 100' CONTOUR. ONCE IN 70 YEARS AT 105' CONTOUR.)	(ONCE IN 32 YEARS AT 100' CONTOUR. ONCE IN 120 YEARS AT 105' CONTOUR.)

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FIGURE 1–A

MANAGEMENT AND PRODUCTIVITY GROUPS *

▓ Soils slightly acid to alkaline in reaction and are friable throughout; surface drainage is good; easily tilled and seeding and planting begin early in spring; adapted to growing of all crops and yields generally high; growing of legumes for cover crops and green manure are common practices and some commercial fertilizers are used.

▨ Soils either somewhat more difficult to till than those in Group A or naturally slightly less fertile and less productive under common practices. They are still recognizd as comparatively very good soils The reaction is generally slightly acid to alkaline and surface drainage is generally good

▧ Dominant soils (the medium to light-textured Yazoo soils) generally characterized by light colored surface soils and semi-compact to compact subsoils. They are lower in fertility than the soils of groups A, B, and D, and are more limited in their crop adaptation than the soils of groups A and B. They are generally medium to decidedly acid. Surface drainage fairly good but internal drainage fair. More careful management is needed to maintain or improve fertility, but they are comparatively easy to till. The growing of legumes for cover crops and green manures and the application of commercial fertilizers are common practices.

▩ Soils slightly acid to alkaline and are inherently very fertile. Surface drainage is required and internal drainage is slow. Their heavy clay texture and peculiar structure (buckshot) and difficulty of tillage are outstanding characteristics. Unfavorable moisture relationships often limit the yields of some crops. Thus wet conditions during the early part of the growing season limit cotton and alfalfa yields, whereas dry conditions later on affect corn adversely. Winter oats appear to be a satisfactory crop. Few cover crops are now grown. Continued use without special practices depletes the supply of available nitrogen, and increases the unsatisfactory moisture conditions and difficulty of tillage.

░ Heavy clay soils generally acid to slightly acid in the surface and decidedly acid (pH 5.0-5.5) in the subsoil. Surface drainage inadequate, few areas cultivated for any period of time in the Yazoo backwater area. Compared with soils of Group D, they require more careful management to maintain available nitrogen, satisfactory moisture relationships, and workability, as inherently they are lower in their content of organic matter and mineral bases.

▨ Except for better surface drainage, more acid surface, and a compact subsoil, these soils are otherwise similar to the soils of Group E. Sandy textures occur generally at some depth, but not commonly above a depth of 36 inches. Only a small percentage of the area has been cleared, and a rather large percentage of these areas has been abandoned.

* The management and productivity groups are complex areas of soil types which are dominated by soil types that are adapted to the same general crops, methods of management, and have about the same drainage and productivity. Other minor soil types included in the area may properly belong in a higher or lower group but because of small size of areas, were included in other management and productivity areas.

——— HIGHWAY

═══ LEVEE

┼┼┼┼ RAILROAD

——— YAZOO BACKWATER AREA BOUNDARY

- - — - COUNTY BOUNDARIES

DOMINANT SOIL TYPES

Soil Type Number [1]	Soil Type Name [2]	Management and Productivity Group in which the individual type belongs [3]
26	Cameta very fine sandy loam	A
27	Cameta loam Cameta silt loam	A
28	Cameta silty clay loam	A
51	Fitler clay	D
29	Halpino silty clay loam	A
22	Panther clay	E
3	Penjur silty clay Penjur clay	B*
6	Sarpy fine sandy loam Sarpy very fine sandy loam	A
7	Sarpy silt loam	A
58	Sarpy-Halpino clay	B
2	Sharkey clay	D
49	Tralake clay	D
41	Yazoo silt loam	C
21	Yazoo silty clay Yazoo clay	F

[1] The numbers on the map denote the dominant soil types comprising each soil area.

[2] Soil type names have not been officially correlated

[3] Management and Productivity classification based on permanent subsistent system of agriculture which includes cotton, corn, oats, alfalfa, soy beans, cover crops, and management.

* These soils generally occur in small areas and so are necessarily shown on the map as associates of other soils and hence may be placed in other Management and Productivity groups. For example, Penjur silty clay classified in the B group occurs in certain areas in association with the Cameta and Sarpy soils and is shown in the A group. Another example is Chicot clay with a classification of C. It is associated with Sharkey and Fitler clays that are grouped in Group D. As a result, nearly all of the areas of Chicot clay are included in the D group on the generalized group map, although the soil itself is considered to fall into the C group. One reason for the generalization of these groups is the general reconnaissance nature of the soil mapping which made it impossible to delineate or map separately the soils that occur in detail or complex association with other soils.

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FIGURE I-B

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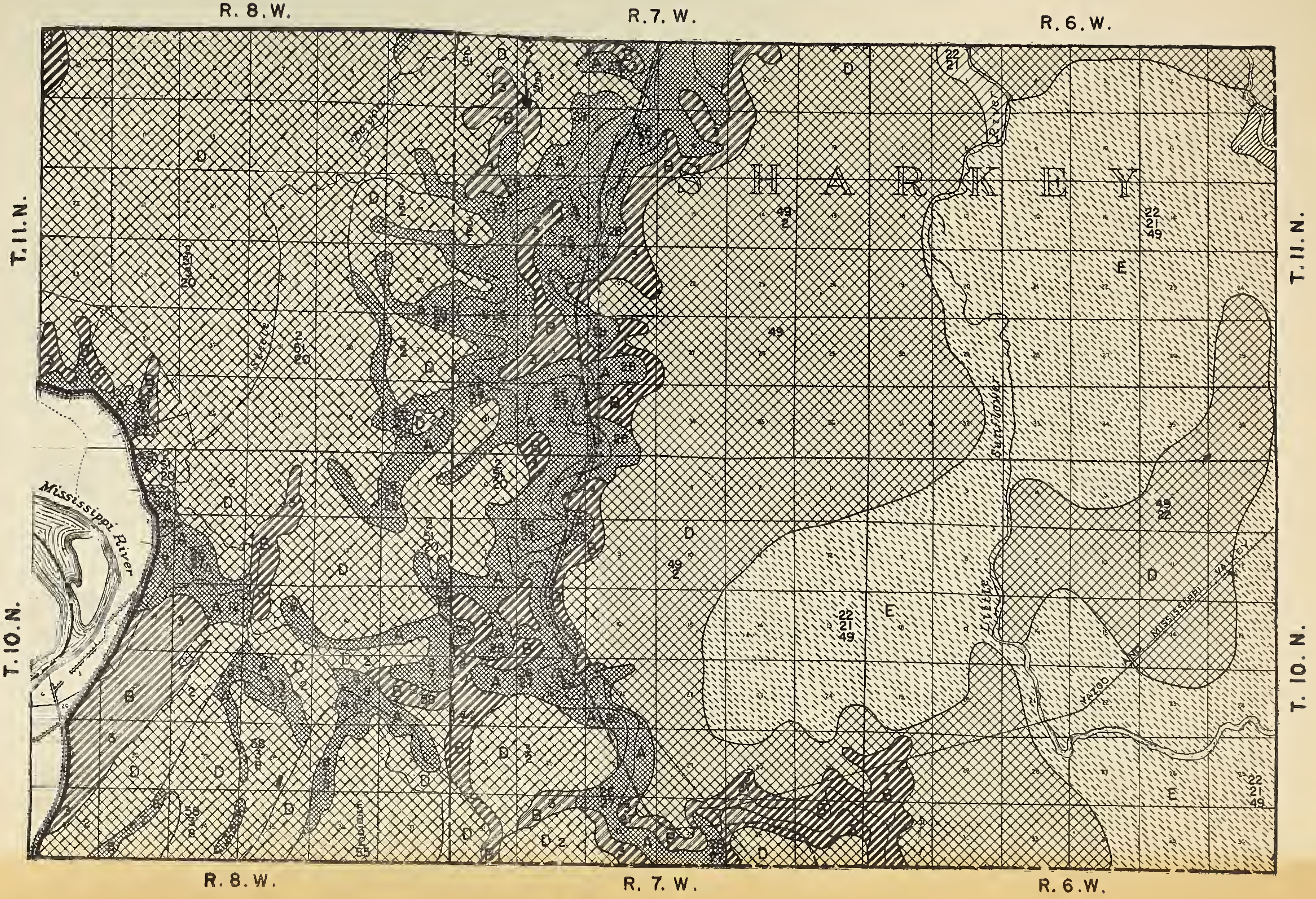
SOILS

SECTION OF MISSISSIPPI BACKWATER AREAS, YAZOO SEGMENT



SCALE: MILES

The F soils differ from the E soils in that they have somewhat better surface drainage, a more acid surface soil, and a more compact sub-soil. However, there are no significant differences in crop yields in E and F soils areas.

NEW-LAND SETTLEMENT

Newly cleared land and temporary farm buildings, typical of pioneer settlements, are common parts of the landscape of the Backwater Area (fig. 2). The inhabitants generally are former tenant or wage families from plantations of the adjoining areas, or they may have come from more distant upland sections.

Most of the recent settlers are prospective owners who are just beginning to develop their farms. Of the families interviewed in 1940, 60 percent had been on their farms less than 3 years. Some form of owner relationship to the land was quite common but only a few owned their farms clear and the remaining 30 percent were clearing-lease tenants, who receive all of their crops during the first 3 years in exchange for their clearing of the land, or they rent the land for cash or crop rent.

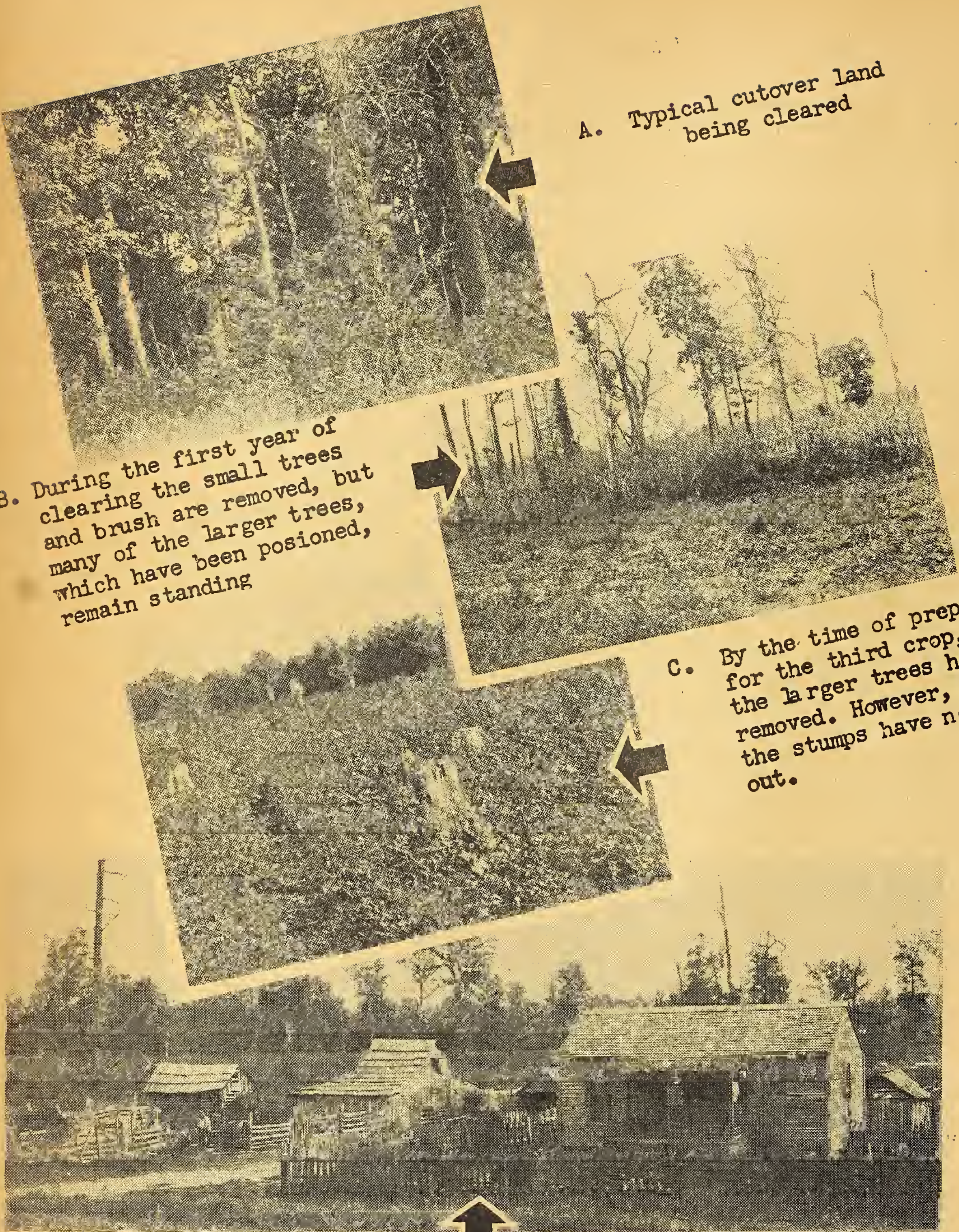
Considerations in Acquisition of Land

The chance that a new-land settler will become a debt-free owner depends largely upon the size of tract he buys; the productivity, elevation, and purchase price of the land in the tract; the amortization terms for the unpaid balance; and the amount of capital he owns. The average size of new farms for which information was obtained was about 49 acres. Prices paid by settlers for cut-over land varied considerably, depending chiefly upon the type of vendor from whom the land was bought (table 1). About one-fourth of the settlers bought State tax-delinquent land at prices ranging from $1.25 to $3 per acre. These were mainly cash purchases.

Individual land-owners were the most frequent sellers of cut-over land. Prices paid for land bought from individuals ranged from $6.25 to $47, and averaged about $20 per acre. Practically all these were time purchases with down payments averaging $3.77 per acre. Thus, the average tract bought from individuals required a down payment of $184, and a 6-year payment plan. With equal principal payments and 6 percent interest per year on the unpaid balance, a payment of $180 is required at the end of the first year. Payments decrease about $8 per year until the balance is paid. Of course, there are variations, but these averages give a good idea of the amount of cash the settler is expected to have each year, after he has paid crop costs, development costs, and family living expenses. These cash-cost burdens do not allow "emergency" expenses or crop losses of any size, so foreclosures are not uncommon.

Limitations in Developing New Farms

Success in developing 40 or 80 acres of cut-over land into a well-balanced, adequately improved farm unit depends upon several physical and economic factors. These factors include density of timber stands, adequacy of drainage for crop production, amount of savings or credit available for necessary improvements, and cotton-acreage allotments. Ultimate success in these new farms depends on hard work, adequate financing, and good management. Failure in any one of these essentials may dim any hope for farm ownership.



A. Typical cutover land being cleared

B. During the first year of clearing the small trees and brush are removed, but many of the larger trees, which have been posioned, remain standing

C. By the time of preparation for the third crop, most of the larger trees have been removed. However, many of the stumps have not rotted out.

D. A new-settler homestead

Figure 2. - The land-clearing process, Yazoo Backwater Area.

Table 1.- New-land purchases, prices, and payment terms, by type of vendor, Yazoo Backwater Area, 1939

Type of vendor	Farms purchased		Purchase price per acre		Time-purchase contracts 1/	Down payment		Payment terms	
			Average	Range		Per acre	Average per farm	Years	Interest rate
	Number	Acres	Dollars	Dollars	Number	Dollars	Dollars	Number	Percent
Individual	24	1,172	19.99	6.25 to 47.00	23	3.77	183.96	6	6.3
State	10	455	1.48	1.25 to 3.00	3	1.15	52.50	3	0
Other 2/	4	200	7.20	6.00 to 12.00	4	1.86	93.00	6.5	6.5
Total and average	38	1,827	13.97	1.25 to 47.00	30	2.91	139.79	6	6.1

1/ The difference in the number of time-purchase contracts and total number of farms purchased is accounted for by cash purchases.

2/ These vendors include two drainage districts and one insurance company.

Improvement Costs

The new settlers spent an average of about $289 cash for farm improvements during the first 3 years on their farms. Much of this had to be spent during the first year. This cash was expended about as follows: a house, $230; a barn, $35; a pump, $13; and fences, $11. Evidently, settlers made full use of available materials and family labor when making buildings and improvements. Improvements must usually have been meager. Past cuttings have left only limited quantities of farm timber suitable for building, so it is necessary that new owners have savings, or an established off-farm income, or a source of credit for buying lumber.

Heavy demands are made, during the first 2 years of the development, on the cash funds and the family's labor. Clearing and other improvements are expensive and time-consuming, but the need for crop income demands that as much land as possible be cleared, ditched, and plowed. As these demands appear at the same time, they form an effective limit to the success of many of the families.

The usual methods of clearing land on small farms involve the removal of all trees less than 14 inches in diameter and the poisoning of all larger timber, in preparation for the first crop. The large trees are removed at convenient seasons during the first 2 or 3 years. The new-land farmers estimated that an average of 7 days of man labor and 3 days of mule work were required in clearing each acre of land for the first crop. During the second year, an average of 3 days of man labor and 2 days of mule work were necessary. This decreased during the third year to 2 days of man labor and 1 day of mule work. Thus, during the first 3 years, a total of 12 days of man labor and 6 days of mule work per acre were expended in clearing land (table 2).

Most of the land clearing on small farms is done by the family. Approximately 65 percent of the interviewed operators used their family entirely in developing their land. An average for the entire group indicates that 86 percent of the labor used by all operators was furnished by their families. The remaining 14 percent was furnished by day hands, by contractors who cleared on a per acre basis, and by clearing-lease tenants.

The prevailing land-clearing wage for day labor varies slightly with different conditions, but the average approximates $1 a day. In addition to the small amount spent for hired labor, a cash expenditure of 30 cents for tree poison is commonly made for each acre of new land cleared.

Table 2.- Labor and materials used per acre for clearing land, first 3 years of cultivation, Yazoo Backwater Area

Item		First year	Second year	Third year	Total
Man labor	(days)	7	3	2	12
Mule work	(days)	3	2	1	6
Poison:					
Amount	(gallons)	3/4	0	0	3/4
Cost	(cents)	30	0	0	30

New-land settlers cleared an average of 10 acres the first year, 6 acres the second, 4 acres the third, 1 acre the fourth, and one-half acre each in the fifth and sixth years. Thus 22 acres were made available for crop production by the end of the sixth year, on these farms. Three-fourths of this acreage was cleared during the first 2 years on the farm, when other tasks also required a large amount of the family labor.

The total labor used and cash expended in clearing land on new farms are about the same during each of the first 3 years (table 3). A total of 70 days of man labor was required on the 10 acres cleared the first year; 10 days were hired and the remaining 60 days were furnished by the family. During the second year, 72 days of labor were required to clear an additional 6 acres of land, and to remove a part of the decayed and fallen timber from the 10 acres cleared the first year. The total labor requirements for clearing during the first 3 years varied only from 66 to 72 days, and the usual cash expenditure for the labor hired and the poison used varied only from $10.20 to $13, even though the land cleared decreased from 10 acres the first year to 4 acres the third year. This is true because it takes 3 years to clear any 1 acre of new land.

The fact should not be overlooked that the 70 days of labor required during each of the first 3 years must come between the harvesting and planting seasons which is a period of heavy rainfall and inclement weather. Putting up buildings and making other improvements also require a part of the operator's time during this period.

Table 3.- Labor and cash used to clear new land, first 6 years on typical farm, Yazoo Backwater Area

Year on farm	New land cleared	Total labor required 1/ Family labor	Hired labor	Total	Mule work	Poison used Quantity	Cost	Total cash outlay 2/
	Acres	Days	Days	Days	Days	Gallons	Dollars	Dollars
1	10	60	10	70	30	7.5	3.00	13.00
2	6	62	10	72	38	4.5	1.80	11.80
3	4	57	9	66	34	3.0	1.20	10.20
4	1	27	4	31	17	0.75	0.30	4.30
5	0.5	12	2	14	8	0.38	0.15	2.15
6	0.5	6	1	7	4	0.38	0.15	1.15

1/ Based on information shown in table 2.
2/ Includes cash outlay for poison and hired labor; value of family labor is not included.

Income and Expenses

Final success of these families also depends upon how rapidly they can develop the farm unit, adopt a properly balanced cropping system, and realize the full productive capacity of the farm unit. As the annual payments and the price usually paid for cut-over land are based to some extent upon the anticipated returns from the land after it is fully developed, it is highly expedient that full development be made as rapidly as possible.

New settlers are much interested in what they will be doing and how much income they can expect during their first years of settlement. What crops and income will they have in their first year? Their third? Their sixth? Approximate answers can be obtained by examining farms, operating in 1939, that had been established 1, 3, and 6 years (table 4). These "usual" farms are rather typical of new-settler progress in this area.

The 10 acres available for crops during the first year included 5 acres of cotton, 4 acres of corn, 0.5 acre of sorghum, and 0.5 acre of garden and truck crops. Yields of cotton averaged about 300 pounds per acre, and yields of corn about 20 bushels. This organization returned a gross cash income of about $273 the first year. Minus the cash operating expenses of $152, this left a usual net cash income of $121 for the settler's first year.

Table 4.- Usual farm organization and income on new-land farms at various stages of development period, Yazoo Backwater Area

Item	Unit	Year on farm		
		First	Third	Sixth
Land organization:				
All land	Acres	40	40	40
Cropland	do	10	20	22
Woodland and waste	do	30	20	18
Cropland organization:				
Cotton	do	5	6	8
Corn	do	4	11.5	11.5
Soybeans or cowpeas	do	0	1	1
Sorghum	do	0.5	1	1
Garden and truck crops	do	0.5	0.5	0.5
Operator's income and expenses:				
Income:				
Cash	Dollars	273	413	518
Non-cash (perquisites)	do	222	222	222
Total	do	495	635	740
Expenses:				
Cash	do	152	121	135
Depreciation	do	39	43	47
Total	do	191	164	182
Net cash income 1/	do	121	292	383
Total net income 2/	do	304	471	558

1/ Net cash income is gross cash income minus cash expenses. It represents the return to capital and cash wage for labor and management. It is the amount available for family living and for debt and interest payments

2/ Total net income is total gross income less total expenses.

Farm perquisites valued at $222 are produced and used by the family during the first year, which increases the total net income to $304. 2/

The small cash income, even when farm perquisites are added, is scarcely enough to maintain a minimum adequate level of living. A source of credit or accumulated savings are usually required to supplement the farm income during the initial period. Should flood losses occur during any of the first 3 years, the operator would find it even more difficult to meet his obligations. Most of the new settlers have very little savings, and any unfavorable circumstances may prove disastrous. Credit sources are often non-existent or limited, and the small amount of collateral which can be used for security encourages high interest rates and greater hesitancy on the part of lending agencies. Where off-farm jobs are available, settlers often use this means to supplement their income; however, the land clearing and farm improvement that can be done by the farmer will be reduced correspondingly.

Farmers producing their third crop in 1939 had 20 acres available for crops. Six acres were planted to cotton and 11.5 acres to corn. The remaining 2.5 acres were divided between summer legumes, sorghum, and garden and truck crops. Cotton yields average about 345 pounds per acre on land that is producing its third crop. Under these conditions a net cash income of $292 is the usual expectation. When non-cash expenses and perquisites are considered, a total net income of $471 is indicated. At this stage in the development period, the net farm income approaches the minimum required for family living, and perhaps a small payment could be made on the land debt.

During the sixth year, new-land settlers have about 22 acres available for crops, of which 8 acres are devoted to cotton, 11.5 acres to corn, 1 acre each to summer legumes and sorghum, and 0.5 acre for the home garden. With this cropland organization, and an average cotton yield of 345 pounds of lint per acre, a net cash income of $383 and a total net income of $558 represent the usual expectation. Thus the income becomes sufficient to support a somewhat more adequate level of living, and to permit a small payment on the land.

Land payments cannot be met from the earnings on new farms during the early years of the development period. Based on land prices and payment terms indicated in table 1, the first annual payment on a tract of 40 acres would approximate $150. New-land purchasers usually earn a net cash income of about $121 during the first year and are obligated to pay $41 interest and $108 principal on their land, in addition to cash living expenses. During the third year a net cash income of $292 is avail-

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2/ Perquisites are commodities grown on the farm and consumed in the home. The amounts and values of these various commodities are shown in table 24.

able for making interest and principal payment of $134 on land, and paying cash living expenses. The net cash income increases to $383 for the sixth year, which, after making the required land payment of $114, leaves $269 available for family living (table 5).

Table 5. - Cash available from farm income for family living at various stages of development of typical one-mule new-land farm, Yazoo Backwater Area

Item	Year		
	First	Third	Sixth
	Dollars	Dollars	Dollars
Net cash income	121	292	383
Land payments:			
Principal	108	108	108
Interest	41	26	6
Cash left for family living	-28	158	269

A deferment of payments during the first 3 years and a longer amortization period are needed for new-land settlers who do not have sufficient savings or credit sources to meet these obligations. Some of the interviewed settlers were delinquent with their land payments, and reports of others having been foreclosed were not uncommon. Some purchasers get extensions on unpaid installments, and others find additional sources of credit. On the whole, it would seem that past credit arrangements could be improved considerably.

Cotton Acreage

The above analysis of new-land farms at different stages in the development period is based upon present new-land farms in the Backwater Area, which had been developed to these successive stages by 1939. These data do not indicate all of the problems which new-land settlers, starting at present, would encounter in the development of their farms. The chief difficulty not considered involves obtaining increased cotton-acreage allotments as additional land is cleared. Data previously presented indicate that present new-land farms in this area which were in the third year of their development in 1939, had about 6 acres of cotton per farm, and those being farmed the sixth year had approximately 8 acres of cotton per farm. Development of these farms took place during a period when cotton allotments of more than 5 acres could be established for new farms on the same relative basis as the allotments for old farms without incurring penalties under the AAA program.

In 1938 and subsequent years, farmers by referendum have each year approved cotton marketing quotas by a large majority. Therefore a farmer who produces an amount of cotton in excess of his cotton marketing quota incurs a penalty when the excess is sold. Under the 1941 program some new farmers who have 10 acres of cleared land might be permitted to plant as much as 5 acres of cotton, but are not eligible for conservation payments on cotton, in 1942 and later years they are eligible to receive full conservation and parity payments. For 1941 and previous years an allotment of more than 5 acres could be obtained for the first year only if the acreage cleared were double that for an old farm which would receive an allotment of more than 5 acres. Thus allotments (of more than 5 acres) to new farms were limited to not more than one-half of the allotment for the same size farm having a cotton history. During the first year, new-land farmers who are not interested in other farms which do not comply with the AAA and who do not plant more than their alloted acreage are eligible, as are other farmers, to receive AAA cash assistance to offset a part of the cost of carrying out recognized soil-building practices, and are permitted to market penalty-free the entire amount of cotton produced. They are also eligible for a loan on all their cotton at not less than 85 percent of parity (parity 18.36 cents a pound on March 15, 1942). If they knowingly overplant their cotton acreage allotments, they are eligible for cotton loans only on the cotton produced in excess of the cotton marketing quota and at 60 percent of the rate to cooperators and are not eligible for any AAA payments; furthermore, they are subject to a penalty on all cotton marketed in excess of their marketing quota (alloted acres multiplied by the actual or normal yield of cotton per acre, whichever is larger). However, quotas do not apply to farms producing less than 1,000 pounds of lint cotton. These new-land farmers who continue to plant within their cotton allotments cannot obtain an allotment greater than the acreage of cotton planted during the first year they received their allotment.

Some farmers are circumventing the allotment provisions of the Agricultural Adjustment Act of 1938 by foregoing for 1 year the current advantages which the AAA program offers and planting as much cotton as the family can handle efficiently. Thus under the present program a cotton-acreage history sufficient to provide a larger cotton allotment to the farm can be established and the future earning power of the farm is thus enhanced.

This has several unfortunate implications. In the first place, many farmers, realizing the fact that we have a 2-year supply of cotton, do not wish to stay out of the program in view of the need for keeping production in line with market outlets. The problem of developing a farm program which will keep production in line with demand for a commodity for which there is a surplus and for which there is a restricted outlet and at the same time will permit new growers to come into production without seriously impairing the income of the old established producers is a difficult one.

INFLUENCE OF BACKWATER FLOODS ON FARMING SYSTEMS AND INCOMES

Floods, sometimes at frequent intervals, have had an important influence upon the land use pattern and the extent of agricultural development in this area. Farm improvements and the cropping systems reflect this flood hazard. Farm buildings of a temporary nature or with special foundations raising them above normal flood stages are common on the lower ground. Such crops as winter legumes, alfalfa, and small grains are seldom planted below the 95-foot contour.

Flood Frequency and Duration

The frequency of floods is directly related to the elevation. Floods occur often enough to be important in all areas below the 97.5-foot contour. Land at the 85-foot elevation is flooded on an average of once each 1.3 years, while at the 97.5-foot elevation, land is flooded only once each 9 years (table 6). However, only about two-thirds of the floods occur during the crop season (April 15 to November 30). In addition, some of the winter floods remain on the land until well into the crop season, especially at the lower elevations. Both types of floods cause considerable agricultural damage and limit the use of the land for crops. The spring floods usually appear from April 1 to April 20 and recede about May 10 to May 23, depending upon the elevation (table 6). The average duration of the floods reaching the 85- and 97.5-foot elevations are 59 and 16 days respectively. Although floods have shown some consistency in reaching a given elevation at usual dates, there are wide variations in the date of occurrence. It is in these extreme cases, when floods occur late in the crop season, that crop losses are the heaviest.

Flood Damages

Agricultural damages resulting from floods are of three types: (1) damages to improvements and costs incident to evacuating areas that are severely affected; (2) labor and material already used in preparing crops, which are lost when the floods occur; and (3) reduction in income resulting

Table 6.- Frequency, dates, and duration of floods, Yazoo Backwater Area 1/

Elevation Mean Gulf Level	Flood frequency		Date land inundated		Date floods recede		Average duration
	Annual	Crop season 2/	Usual	Range	Usual	Range	
Feet	Year	Year					Days
85	1.3	1.6	April 1	2/1 to 6/27	May 23	5/5 to 7/28	59
87.5	1.5	1.9	" 1	2/25 to 5/16	" 15	4/26 to 7/26	47
90	1.8	2.5	" 5	3/10 to 7/7	" 12	4/22 to 7/20	36 3/
92.5	3	4.5	" 10	4/2 to 4/16	" 12	4/24 to 6/19	37
95	5	8.0	" 18	4/6 to 5/27	" 12	4/20 to 6/13	21
97.5	9	15.0	" 20	4/8 to 4/24	" 10	4/18 to 5/16	16

1/ Data taken from Mississippi Backwater Areas Study--Yazoo Segment, U. S. Dept. of Agr., Joint Investigation, Flood Frequencies Section, Division of Land Economics, Bureau of Agricultural Economics, 1941.

2/ Crop seasons include the period April 15 to November 30.

3/ Durations of floods at this elevation are less than at the 92.5-foot elevation because of the larger number of floods which reach this elevation and do not reach the 92.5-foot elevation.

from the delayed planting of crops or complete crop losses because floods recede too late for replanting.

The amount of damages to improvements, feed supplies, and operating equipment caused by floods depends largely upon the type of farm improvements involved and the height and duration of floods. As farm buildings at the lower elevation are commonly erected on special foundations, floods which reach only a medium height usually do not cause much damage. A large portion of the floods at the 85- to 92.5-foot contours are of this character. Only the extreme floods reach the higher elevation, but they are the more destructive floods at all elevations. For these reasons, the damages to improvements and costs of evacuation are greater on a per flood basis at the higher than at the lower elevations (table 13).

Considerable labor and materials are often spent in preparing the land and planting crops before floods occur. Most of the preparation has to be repeated before another crop is planted, and the seed and fertilizer already used are lost. Such losses are greatest for cotton and corn because (1) the land requires considerable preparation, (2) the fertilizing and planting are usually done relatively early in the spring, and (3) approximately 80 percent of the cropland is devoted to these crops. On small farms at the 85-foot contour,,an estimated average of 86 cents per acre of cotton and $1.40 per acre of corn are expended before the usual flood comes. When these expenditures are distributed on a crop-acre basis, the total expenditure averages 90 cents per acre of cropland. As more floods occur at the 85-foot elevation, the loss per year from floods averages 57 cents per acre of cropland, compared with only 5 cents per acre at the 97.5-foot contour (table 14).

The major portion of flood damages in the Backwater Area results from the reduction of incomes during years when floods prevent the normal planting and harvesting of crops. Floods may remain on the land considerably beyond the normal planting dates and thus the crop yields are reduced. Sometimes floods remain on the land until it is not feasible to plant cotton and the only alternative is to plant corn or other feed crops from which a comparatively small income can be realized. Records of floods indicate that the average flood recedes from the 85-foot elevation so late that cotton yields on the average are reduced 53 percent, and corn yields 41 percent, below the yields possible in years in which no flood occurs. This percentage reduction declines at the higher elevations, and averages 14 percent for cotton and 19 percent for corn at the 97.5-foot contour (table 15). Considering these reductions in yields and the average flood frequency, an average reduction of annual income of $11.76 per acre of cotton and $1.23 per acre of corn, or $5.20 per acre of cropland, is indicated for small farms on C soils at the 85-foot elevation. This reduction decreases to an average of only 16 cents per crop acre at the 97.5-foot contour (table 16).

When the three types of damages are summarized, the importance of the relation of elevation to total damages is evident. For example, the damage on a 40-acre family farm on old D soils varies from approximately $5 per year at the 97.5-foot elevation to $115 per year at the 85-foot elevation (table 7). Farms having 19 acres of cropland, typical of the one-mule cotton farms now in the Backwater Area, have an average if 8 acres each of cotton and corn, and 3 acres of other feed and food crops. Total damages per year on these farms, at the 85-foot elevation, range from $83 on old E soils to $147 on new D soils. Damages decrease significantly at the 92.5-foot elevation where they approximate $25 per year.

Table 7.- Total flood damages and income reduction, specified family farm organizations, Yazoo Backwater Area

Soils group areas	Elevation (feet)											
	85		87.5		90		92.5		95		97.5	
	Per flood	Per year	Per flood	Per year	Per flood	Per year	Per flood	Per year	Per flood	Per year	Per flood	Per year
	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
	Farms with 19 acres of cropland											
A	198	123	179	95	166	66	115	25	116	14	78	5
B	193	120	175	92	162	64	112	24	114	14	77	5
C	176	110	158	83	149	59	105	23	106	13	70	5
D (new)	235	147	214	113	197	78	137	30	138	17	91	6
D (old)	184	115	166	88	154	61	106	23	107	13	73	5
E (new)	215	134	195	103	180	72	124	27	125	15	83	5
E (old)	133	83	121	64	113	45	74	16	85	10	56	4
	Farms with 30 acres of cropland											
A	296	185	269	142	249	99	172	38	175	21	118	8
B	289	181	263	139	243	96	168	37	172	21	116	7
C	279	174	249	132	236	93	165	36	165	20	112	7
D (new)	352	220	321	169	295	117	207	46	207	25	137	9
D (old)	276	172	250	132	231	92	158	34	161	19	110	7
E (new)	323	201	293	155	270	107	187	41	188	23	125	8
E (old)	200	125	181	95	169	67	115	25	122	15	85	5
	Tractor-oat-soybean farms with 150 acres of cropland 2/											
C	--	--	--	--	--	--	--	--	1406	278	1444	160
E (old)	--	--	--	--	--	--	--	--	1451	288	1490	164

1/ Based on data presented in tables 13 and 16. Total damages include: (1) damages to improvements, food supplies, and operating equipment; (2) labor and material expended before floods occur; and (3) reduction in income due to reduced crop yields.

2/ For full explanation of this organization see pages 23 - 24.

The cropland organization on farms with 30 acres of cropland includes 12 acres of cotton, 12 acres of corn, and 6 acres in other feed and food crops. Total damages per year at the 85-foot elevation range from $125 on old E soils to $220 on new D soils, and they approximate $100 per year for most of the soils areas at the 90-foot contour. At this elevation, damages are sufficient to affect seriously the possibility of using the land for family farms.

The importance of flood damages may not be fully realized if only the damages per year are considered. In reality, losses are not distributed on a yearly basis; they occur in larger amounts at varying intervals. At the 90-foot elevation, damages on family farms having 30 acres of cropland range from $295 on new D soils to $169 on old E soils. These damages are inflicted on an average of once each 2.5 years. Damages imposed in this way are more serious to the small farm operator than a regular loss of a smaller amount each year.

ANALYSIS OF FAMILY-FARM ORGANIZATIONS AND INCOMES

Family-sized cotton farms are more numerous and more standardized than any other farm organization. The distribution of cropland, equipment, methods of production, and incomes are rather similar for these farms, not only in the Backwater Area, but all over the Delta. In general, there are two predominant sizes of family cotton farms. The chief factors determining the size are the quantity of cotton the family can handle, and the mule power the farmer has available. Cotton requires a large amount of hand labor. There are two distinct "bottlenecks" with regard to the labor requirements.

The relatively large amount of labor required to harvest cotton constitutes the first; this limits the acreage handled per family. Survey data indicate that the average family picks about 5 bales of cotton in a season, and usually hires outside labor for harvesting any additional production. With 6 to 8 acres of cotton and the usual proportion of feed and food crops, families having one mule can usually do all the work required throughout the year. Thus the one-mule family farm has become common in the Backwater Area.

Families having a larger amount of operating capital or a source of credit, and who are willing to work more days during the year, apparently have expanded their cotton acreage to the point at which the next "bottleneck", is reached - the quantity that can be chopped out by the family. These families usually operate two-mule cotton farms, thus utilizing the family labor supply more completely, and obtaining other efficiencies that accrue from the use of 2 mules for several operations. It is necessary to hire pickers to harvest part of the crop on the two-mule farm.

Feed Crops Increased

With the recent reduction in cotton acreage the acreage in feed crops has increased considerably and this acreage now produces a large part of the feed requirements on family farms - whereas before the Agricultural Adjustment Administration program began, most of the feed was bought. The total quantity of feed needed for use on family farms is small for there is usually only 1 cow, 1 sow, and about 35 hens in addition to the work stock. Milk, butter, pork, and eggs are produced for family use; in addition, perhaps a calf, a small quantity of poultry products, and possibly a few pigs are sold.

Most of the family-farm operators are "furnished" by merchants or individuals. The furnish may be a cash allowance or merely a charge account at a local store. A lien on the cotton crop is frequently used as security. In any event, the available credit is used primarily for groceries, feed, and seed. The interest charge is frequently high for this type of credit, for there is considerable risk in addition to the cost of servicing such small loans. A few of the small farm operators are financed by the Production Credit Corporation. Also, the Farm Security Administration provides production credit and supervision to several of the low-income farmers.

If they could get lower interest rates and a small increase in the amount of production credit, some operators probably would adopt better farming practices. Thus this group would probably be a better risk if they had additional borrowings than when they have only the minimum amount required for the bare necessities for making a crop and for living.

Another important problem on family farms is to use efficiently for the production of feed and pasture the acreage that is not in cotton. Family-farm operators who do not have the benefit of combines, mowing machines, and hay balers, can best utilize the acreage not in cotton for producing corn but corn yields are low on the C, old D, and old E soils and, even with the customary small numbers of livestock, small farm operators frequently have to buy feed.

Comparison of Incomes

A comparison of the organization and income expectations of four family-farm organizations comes next. The budget method of analysis is used in estimating these income expectations. In these budgets, an attempt has been made to normalize crop yields, prices, costs, and overhead items, in order to eliminate exceptions or unusual conditions. Yields of cotton were based upon AAA records for the period 1934-38. The yields of other crops were based upon data obtained in a farm-management survey, and upon the judgment of soils and agronomy specialists. The basic data used in these budgets are found in tables 17 to 26.

It has been assumed that soils within a delineated area are homogeneous insofar as productivity and soil management are concerned. This applies whether the soils are in cultivation or in woods, and at all elevations, with one exception. Each of the D and E soils groups has been divided because of the wide differences in yields on "new" and "old" soils.

The budgets assume that the 1941 AAA program will continue to function in its present form.

The cropland, labor, and power organizations for these family farms are presented in table 8. A summary of the incomes and expenses per family and per crop acre for the four family-farm organizations is presented by soils groups in table 9.

One-Mule Cotton Farms

The typical family cotton farm operated with 1 mule has about 8 acres of cotton, 8 acres of corn, and 3 acres of other crops. The crops other than cotton and corn usually are 1 to 2 acres of soybeans or cowpeas, a small patch of sorghum, and a garden. The livestock consists of a mule, a cow, a sow, and about 35 chickens. The machinery consists of a turning plow, a middle buster, a one-row cotton planter, and 2 or 3 one-half-row cultivators.

Table 8.- Organizations of family farms, Yazoo Backwater Area

Item	Unit	One-mule	Two-mule	Tractor-cash grain cotton	Tractor-oat-soybean
Total farm area	acres	40	40	120	190
Land use:					
Cropland	do.	19	30	96	150
Woodland and waste	do.	21	10	24	40
Cropland organization:					
Cotton	do.	8	12	7	--
Corn	do.	8	12	--	--
Oats	do.	--	--	44	75
Soybean hay	do.	1.5	2.5	--	--
Soybeans for seed	do.	--	--	44	74
Sorghum	do.	0.5	1.0	--	--
Garden	do.	0.5	0.5	1	1
Idle cropland	do.	0.5	2.0	--	--
Power organization:					
Mules	number	1	2	--	--
Tractor	do.	--	--	1	1
Investment: (½ value new)					
Buildings	dollars	250	250	375	375
Workstock	do.	75	150	--	--
Other livestock	do.	68	68	68	68
Machinery and equipment	do.	75	97	--	--
Tractor and tractor machinery	do.	--	--	1,094	951
Truck	do.	--	--	--	562
Total	do.	468	565	1,537	1,956

The calculated normal net cash incomes to labor, management, and investment on these farms range from $342 on new D soils down to $85 on old E soils, with a differential of more than $100 between new and old soils for the D and E groups. On C soils the net income is $215 as compared with $223 on the old D group. The expenses per farm are slightly higher on the old soils, but are relatively uniform, so most of the range in net income is attributable to the variation in yields and in gross income. Even though the income per crop acre is relatively high for small farms, the net cash income per family is more important than the per acre figure. The income per family must be large enough to provide the necessities of life and meet the interest and principal payments on the farm debt. It is obvious that the income from the one-mule cotton farms on old E soils is inadequate for this purpose, even if the farms were clear of debt.

Table 9.- Summary of income and expenses on family farms, Yazoo Backwater Area 1/

Item	C soils				D soils			E soils				
					New	Old		New	Old			
	One-mule	Two-mule	Tractor-cash grain cotton	Tractor oat-soybean	One-mule	One-mule	Two-mule	One-mule	One-mule	Two-mule	Tractor-cash grain cotton	Tractor-oat-soybean
	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
Gross cash income	452	656	1,890	2,458	524	440	638	476	329	473	1,639	2,215
Cash expenses 2/	237	357	1,067	1,384	182	217	330	182	244	354	1,135	1,478
Net cash income	215	299	823	1,074	342	223	308	294	85	119	504	737
Perquisites	222	222	222	222	222	222	222	222	222	222	222	222
Total net income 3/	437	521	1,045	1,296	564	445	530	516	307	341	726	959
Family labor income 4/	141	212	566	698	268	149	221	220	11	32	248	361
Net income per crop acre:												
Cash	11.32	9.97	8.57	7.16	18.00	11.74	10.27	15.47	4.47	3.97	5.25	4.91
Total	23.00	17.37	10.89	8.64	29.68	23.42	17.67	27.15	16.15	11.37	7.56	6.39

1/ Incomes and expenses represent normal expectations during years when no backwater occurs. Average net cash income adjusted for annual backwater damages are given in table 10.

2/ Depreciation charges have been included in cash expenses.

3/ Total net income is net cash income plus perquisites. It represents returns to labor, management, and investment.

4/ Family labor income is net cash income less interest on investment.

Two-Mule Cotton Farms

Two-mule family farms are almost as common as the one-mule farms described above. These farms usually have about 12 acres in cotton, 12 acres in corn, $2\frac{1}{2}$ acres of soybeans, 1 acre of sorghum, and one-half acre of garden. The two head of work stock furnish adequate mule power for this acreage of crops, and by making fuller use of the family labor than do the one-mule farmers, these families can do all of the work of producing the crops, but cannot pick all the cotton. Apparently these operators have pushed the acreage up to the next bottleneck, which is usually met in the acreage of cotton that can be chopped out by the family.

The net cash income to labor, management, and investment on these two-mule farms is $308 on old D, $299 on C, and only $119 on old E soils. In general, they are about 40 percent higher for all soils groups than the incomes on one-mule farms. The cash expenses are rather uniform between soils, just as is the case on the one-mule farms. The very low income on old E soils is attributable to the relatively low yields.

Because of the low yields of corn on the C, old D, and old E soils, and in view of the high yields of oats, the substitution of oats for corn is rather profitable provided the use of harvesting equipment can be had at reasonable cost. Small farmers cannot grow sufficient acreage to justify owning a combine or binder, but a group of small farmers, with the aid of a sponsoring credit agency, could perhaps use one efficiently. Cooperative machinery service like this is now sponsored on a limited scale by the Farm Security Administration; it appears to be worthy of expansion.

The substitution of 12 acres of oats for 12 acres of corn on the two-mule farms on old D soils would increase the net cash income by about $70 under the assumptions used in budgeting and at elevations where backwater losses are negligible. The yield of oats is 55 bushels, compared with 10 bushels of corn. The cost of "combining" oats is 6 cents per bushel, and the cost of grinding is 4 cents per bushel. The operator has 325 bushels of oats for sale after making allowance for the livestock on the place. A small quantity of corn would be bought for family use. The backwater damages at the 95-foot elevation for this organization are $35 greater than for the organization without oats, and $18 greater at the 97.5-foot contour. Above this elevation the damages are not important.

Tractor-Cash Grain-Cotton Farms

Farmers who have adequate managerial ability, located at and above the 95-foot contour, could expect to increase their earnings by adding two more 40-acre tracts to their present farms, provided they turn to a mechanized cash grain-cotton system. By reducing their cotton acreage to 7 acres, and buying corn for home-use livestock, they can grow a large acreage of oats and soybeans for grain, can work less, and still increase their income. This change necessitates a much larger investment than is the case for the family cotton farms, but even after deducting 6 percent interest on the total investment in mechanized equipment, livestock, and land, the labor income is much larger than for the family cotton farms.

This budgeted organization has 120 acres of farm land, 96 acres of cropland, 7 acres of cotton, 44 acres of oats, 44 acres of soybeans for grain, and 1 acre of garden. The power is provided by a 12 hp. tractor, and the livestock other than mules is the same as on family farms. In addition to the tractor, there is enough equipment to break, prepare, plant, and cultivate the acreage in crops. A 4-foot combine is owned for harvesting oats and soybeans. The farm hauling is handled by the tractor and a tractor-trailer, but hauling the crops to market is hired on a custom basis.

This organization provides for a fairly good distribution of labor during the cropping season. There is a slight conflict in the fall during the harvesting period for soybeans and cotton, but ordinarily the family will be able to pick the cotton before it damages appreciably.

The budgeted net cash income to labor, management, and investment is $504 for old E soils and $823 on C soils, in years when there are no backwater losses. These incomes are considerably larger than those on family cotton farms, even after allowance is made for the interest on the investment.

Labor income for the tractor-cash grain-cotton farm on C soils amounts to $566 as compared with $212 on the two-mule cotton farm, whereas on old E soils the labor income is $248 and $32 respectively.

Tractor-Oat-Soybean Farms

Low yields of both cotton and corn make old E soils submarginal under the present cropland organization and system of management. A more extensive system of farming may be a way out for farms on soils that are suitable for oats and soybeans. A tractor-oat-soybean family-farm organization was analyzed to learn the income from such a system. This farm organization was budgeted on the basis of the acreage that could be handled by the smallest mechanized equipment and the operator's labor. The total land in the farm organization is 190 acres, of which 150 acres are used for crops. The other 40 acres are usually too poorly drained for crop production, but they usually provide fuel and lumber for the farm.

Seventy-five acres of the cropland are used for growing oats, 74 acres for soybeans, and 1 acre for garden. The soybeans are combined and are sold at their oil value, although probably many operators could sell part of their beans for seed at a considerably higher price.

The livestock in this organization, other than work stock, is the same as on the one- and two-mule family cotton farms. The needed corn is bought. Mules and mule equipment are replaced by a tractor and tractor equipment. This equipment consists of one 12 hp. tractor and the machinery necessary to break, prepare, plant, and cultivate the acreage in crops. In addition, there is a 4-foot combine for harvesting the oats and soybeans and a $1\frac{1}{2}$-ton truck for hauling crops and supplies. The harvesting periods occur in such a way that the combine and the labor of the operator can be used efficiently. The investment in land and equipment is considerably larger on this farm than on the one- and two-mule cotton farms.

The net cash income to labor, management, and investment (unadjusted for backwater loss) is $737 on old E soils and $1,074 on C soils. These incomes are considerably higher than the net cash income from one- and two-mule cotton farms. After meeting the requirements for family living the operator should have a reasonable surplus to use for amortizing long-term debts. This organization is not feasible below the 95-foot elevation, where floods occur too frequently to allow the growing of oats.

Suitability of Backwater Area for Family-Sized Farms

The suitability of an area for a certain type of farming depends upon whether or not the physical resources will allow the farmer to get an income that is enough to maintain the farm plant, pay off the farm debt, and afford labor and management a wage equivalent to that offered by the best alternative employment. As there is a wide range in the degree of backwater damage in various parts of the area, this loss is important in determining the profitableness of farming at the various elevations (table 10).

The C and D soils are suitable for two-mule family farms down to the 95-foot contour, if the criterion is the ability to provide the operator with a net cash labor income equal to or greater than that obtained by croppers and wage hands on Delta plantations. The usual net cash income per cropper family was estimated at $190. 4/ In addition to having a labor income larger than that of croppers, the owner-operator would have more perquisites from the farm than the croppers.

The calculated net cash incomes for labor, management, and interest on investment from the two-mule family-farm cotton organization, at the 95-foot elevation, are $279 and $289 on the C and old D soils, respectively (table 10). After deducting $190 as a labor and management charge, approximately $100 would be left as a return for interest on the investment in mules and machinery, and to pay for land and buildings. Therefore slightly less than $3 per acre of cropland is available for paying off the mortgage on land and buildings. This amount ($3 per acre) will amortize, with a 3-percent 40-year plan, about $70 per crop acre for land and buildings, whereas with a 6 percent 10-year plan, it would amortize a debt of only $23 per crop acre. Even with a favorable repayment plan, the operator of an average two-mule cotton farm at the 95-foot elevation on C and old D soils could not pay off a debt of more than $70 per acre in land and buildings, without reducing the already small amount of cash available for living expenses. It is conceivable that the debt might be so high that, during the period of repayment, the operator's level of living would be reduced below that of the present sharecropper.

Typical one- and two-mule cotton farms on old E soils do not provide an income equal to that of the average sharecropper, even if the land were paid for and no backwater damage occurred. Old E soils appear to be satisfactory for the tractor-oat-soybean organization at and above the 95-foot elevation, but will not support nearly so high land values as will the C and old D soils. Below the 95-foot elevation, floods destroy the oats too often for this organization to be profitable.

4/ Data from the farm-management survey indicate that $190 is about the net cash income that might be expected by the average sharecropper family in this area.

Table 10.- Net cash income adjusted for backwater damages, family farm organizations, Yazoo Backwater Area 1/

Elevation mean gulf level	C soils				D soils			E soils				
					New	Old		New	Old			
	One-mule	Two-mule	Tractor-cash grain cotton	Tractor-oat-soybean	One-mule	One-mule	Two-mule	One-mule	One-mule	Two-mule	Tractor-cash grain cotton	Tractor-oat-soybean
Feet	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
						Per family						
85	105	125	--	--	195	108	136	160	2	-6	--	--
87.5	132	167	--	--	229	135	176	191	21	24	--	--
90	156	206	--	--	264	162	216	222	40	52	--	--
92.5	192	263	--	--	312	200	274	270	69	94	--	--
95	202	279	657	796	325	210	289	279	75	104	--	--
97.5	210	292	732	914	336	218	301	289	81	114	381	449
											438	573
						Per crop acre						
85	5.53	4.17	--	--	10.26	5.68	4.53	8.42	0.11	-0.20	--	--
87.5	6.95	5.57	--	--	12.05	7.11	5.87	10.05	1.11	0.80	--	--
90	8.21	6.87	--	--	13.89	8.53	7.20	11.68	2.11	1.73	--	--
92.5	10.11	8.77	--	--	16.42	10.53	9.13	14.21	3.63	3.13	--	--
95	10.63	9.30	6.84	5.31	17.11	11.05	9.63	14.68	3.95	3.47	--	--
97.5	11.05	9.73	7.62	6.09	17.68	11.47	10.03	15.21	4.26	3.80	3.97	2.99
											4.56	3.82

1/ Net cash income represents cash returns to labor, management, and investment. Data pertaining to incomes without backwater damages are in table 9. Data relative to backwater damages are shown in table 7, and the procedure used in arriving at these damages is discussed on pages 13-15.

Operators of one-mule family farms at the 95-foot contour on C and D soils would not have a net cash income equal to that of croppers if interest on investment is considered.

The A and B soils can be profitably farmed at somewhat lower elevations than is the case for the C and D soils.

The above statements in regard to suitability of land for family farms are based upon average drainage costs and tax load. It is recognized that there is a wide range in these costs. In districts where taxes are extremely high or low, the classification as to suitability of land for family farms may be altered.

COMPARISON BETWEEN FAMILY FARMS AND PLANTATIONS 5/

Even though small farms are numerous, the plantation system predominates in the well-developed parts of the Delta and is evident, too, in newer areas. Consideration of the advantages and disadvantages of each of these systems should be helpful in determining the type of organization best adapted to the undevelope portion of the area.

A number of efficiencies accrue to the plantation system largely because of its size and its volume of business. Plantation operators have a considerable advantage in bargaining power and in their ability to obtain goods and services at a discount. They can obtain more favorable terms for the purchase of land, livestock, and equipment, and, ordinarily, have the essential resources for a well-balanced producing unit. On well-managed plantations, the labor, power, equipment, and crops are organized so as to get the highest net return per acre of available cropland. The ability to adjust the labor and power supply to changes in cropland organization, to use efficiently large machinery, improved practices and new techniques, enables large operators to have a large gross cash income per crop acre and lower physical inputs per unit of product than is the case for the one- and two-mule cotton farms.

The physical costs of growing cotton are lower on plantations than on family farms. For example, about 175 hours of man labor are required per bale of cotton on wage plantations on C soils, compared with 224 hours for one- and two-mule cotton farms. The power requirements per bale of cotton are 65 mule hours for family farm operators using half-row equipment, and about 53 hours of mule equivalents on the wage-tractor organization using 4-row equipment. Moreover, the quality of work done with tractor equipment is superior to that carried out with mule equipment.

The physical advantage of plantations over family farms in producing corn and oats is much greater than is the case for cotton, since the proportion of the hand work is much smaller.

Small farmers on heavy soils are at a particular disadvantage owing to the difficulty of turning under green-manure crops with one- and two-mule equipment. As the organic matter becomes depleted, the tilth and moisture-holding capacity of clay soils deteriorates and the problem of preparing a seedbed becomes increasingly difficult. Furthermore, yields of corn decline as organic matter decreases, and the problem of growing feed on small "buckshot" farms becomes acute.

On plantations this problem is not so serious, as there is adequate power for turning under green-manure crops and preparing a seedbed. Also oats and soybeans are well adapted to heavy soils, and as there is usually a large enough acreage on plantations to justify a combine, land not suitable for corn can be used in producing oats and soybeans (fig. 3).

5/ Definitions of terms: A family farm is a farm on which all or a major part of the work is done by the operator and his family. A plantation is a farm of 300 or more acres of cropland and accompanying production resources, operated with wage labor or tenants, or both, and managed as a single unit in respect to the control of labor and of production.

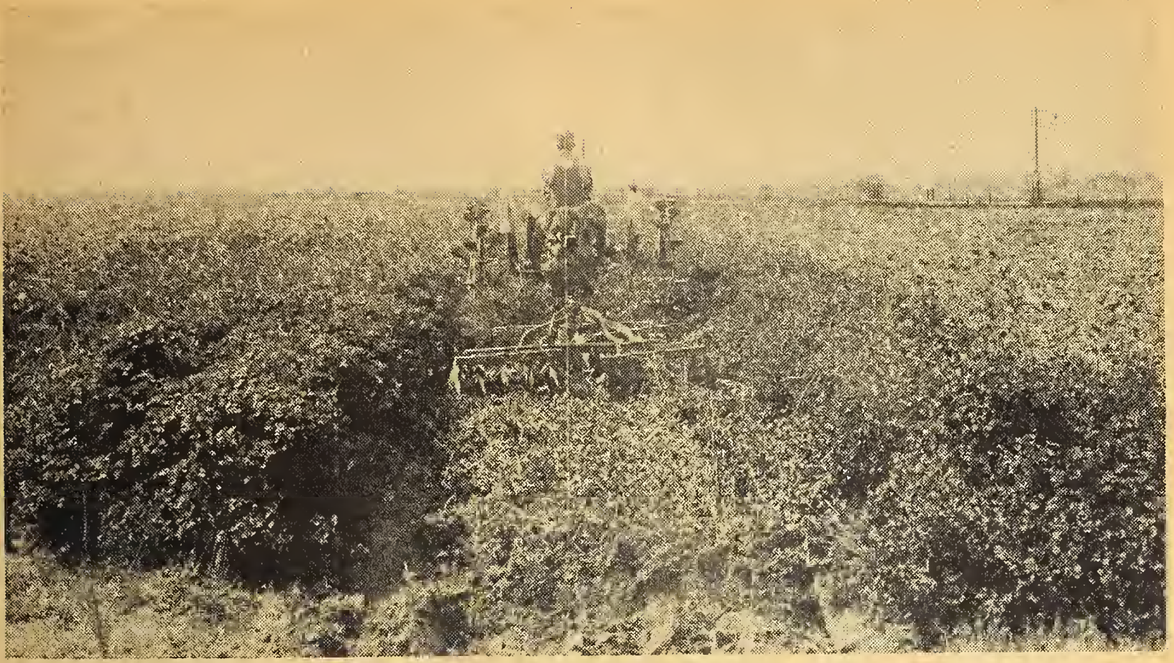

Figure 3a. - To turn under a good growth of winter legumes efficiently requires heavy machinery and power. One and two-mule farmers are handicapped in growing winter legumes because they do not have suitable machinery and power.

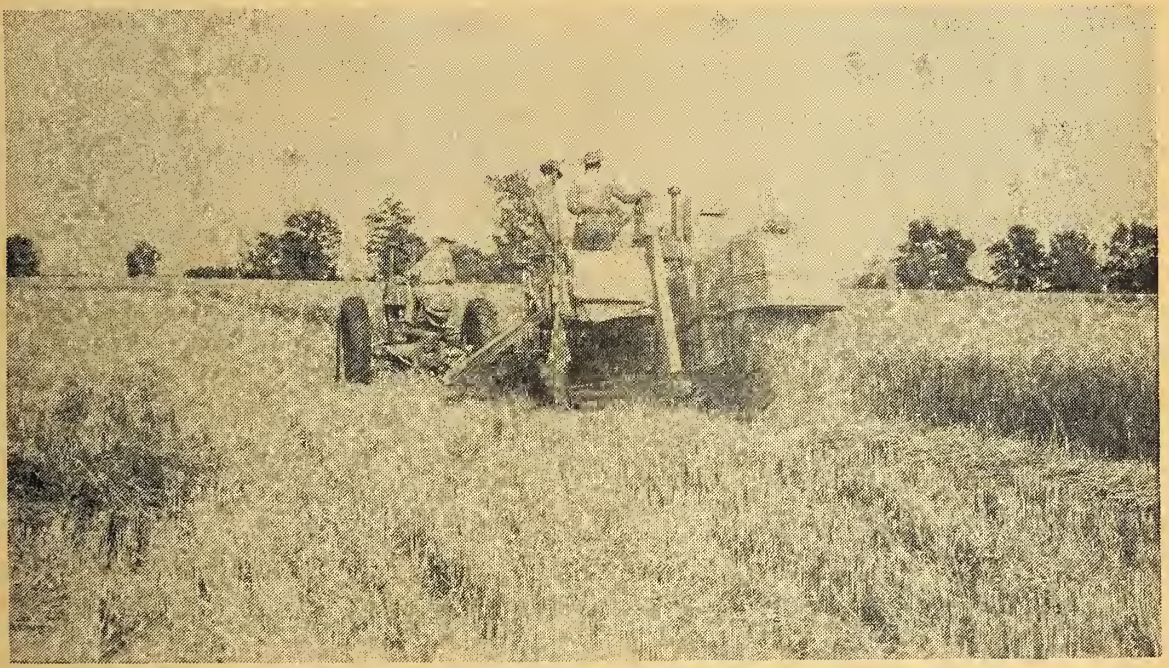

Figure 3b. - A combine is essential to the efficient production of oats in the Delta but it is not economical for a small farmer to own one. Several farmers might economically own and operate one coöperatively.

Figure 3.

In the Backwater Area the high yields of cotton, the premium for long-staple cotton, and the use of large-scale machinery enable plantation operators to keep gross cash income considerably above cash expenses during most years. In addition, plantation operators commonly get higher yields than smaller operators on the same soils within the area.

Plantation operations involve relatively high cash outlays per crop acre, which makes it necessary that cash incomes be maintained at high levels. During periods of low prices or in areas where crop yields are frequently low, plantation operators have difficulty in maintaining incomes above operating expenses. This fact explains the scarcity of cotton plantations on low-yielding soils and their dominant position in the most productive parts of the Cotton Belt. Because operating expenses do not decline in proportion to the decline in income from farm products, plantation operators usually have more serious financial difficulties during periods of low prices for farm products than do family-farm operators.

Plantations do not have many of the advantages of mechanization during the development period for new land, for the presence of stumps precludes the use of tractors, combines, and other heavy machinery. In recognition of the high cash cost of clearing and of the difficulty of using tractor equipment on stumpy land, many of the owners of large tracts of cut-over land prefer to give all the crop for 3 years to clearing-lease tenants, rather than develop the land with wage labor.

The small operators do most of the clearing with the family labor and ordinarily keep the cash cost of clearing down to $3 per acre or less. However, they ordinarily have to borrow money or use up savings in order to supplement the small income obtained during the first 3 years. Owing partly to the better credit and bargaining position and partly to the greater efficiency of large units, a considerable quantity of land cleared by family farmers has been bought by large farm operators or by the more aggressive and efficient of the small operators.

The family-sized farm operators have lower cash expenses per crop acre than do the plantation operators. Too, the necessary cash expenses on family farms represent a much smaller percentage of gross income than is the case for plantations, particularly if perquisites are included. Small operators using only their labor (and that of the family) can exist, during depressions, by cutting down on repairs, replacements, and other overhead costs, and by living mainly "off the farm", if their debts are small. On the other hand, plantation operators must continue to pay about the same prices for gasoline, machinery, farm supplies, credit, and labor, although they can ignore some of their depreciation and need for repairs, temporarily.

A comparison of net cash returns to investment in land and buildings (total net cash income minus estimated charge for labor and management) indicates that considerably larger returns per crop acre are obtained by plantation operators than by family farm operators. 6/ Therefore, plantation operators are in a

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6/ U. S. Dept. of Agr., Bureau of Agricultural Economics, "Farms on New Ground in the Yazoo-Mississippi Backwater Area", (processed), 1941.

position to pay more for developed land than are family-farm operators. This point is not important to family-farm operators who are free of debt and whose incomes are sufficient to provide a satisfactory level of living and maintain the farm plant. However, farmers whose lands are mortgaged must provide a large enough income not only to pay cash living expenses, but also to meet interest and principal payments on the farm debt. The small amount of cash-above-living-expenses on family farms limits the amount that can be used to pay off mortgages.

The above comparison indicates that many of the small farms, after they are cleared, will be combined into larger units unless the production efficiency, the bargaining position, and the credit situation of small operators are improved. Some suggestions for such improvements follow.

SUGGESTIONS FOR IMPROVING THE ECONOMIC STATUS OF SMALL-FARM OPERATORS SETTLING NEW LAND

In planning the development of new land in the Backwater Area, an effort should be made to combine the good features of both plantations and family-sized farm units.

The more important desirable features of family-sized units are the security and longer tenure of the operator compared with croppers and tenants, and the opportunity to grow more farm products for home use. Several desirable features of the plantation system could make the operations of family farms more profitable. They are derived mainly from the large volume of business and large-scale operations carried out on plantations.

Through a comprehensive program of cooperation and other means of assistance to small-farm operators, it may be possible to extend some of the advantages of the plantation system to the operators of small units but such a program will require a great deal of cooperation among small farm operators and, for certain groups, supervision and operating capital will have to be furnished at low costs.

A program of this kind should recognize differences in the financial status and the managerial ability of these farmers. For example, operators who own their equipment, perhaps have some cash, and have had experience in managing small units, would need less assistance than would croppers or wage-hand families who have little or no capital and have always been rather closely supervised. For the former group, many of whom are now trying to develop small farms on cut-over land in the Backwater Area, assistance in acquiring land at reasonable prices and financing the purchase at low interest rates over a long period would probably be enough to enable them to eventually become debt-free owners. For this reason a purchasing agency which would buy the cut-over land in large tracts and resell it in family-sized units is suggested as a means of helping this group of farmers. The chief advantage to be gained by the settlers through this type of program is the chance to buy land at reasonable prices with more lenient credit terms than are usually possible for individual buyers of small tracts.

Clearing the land and selecting the kind of buildings which they can afford and for which they are willing to obligate themselves could be left to the initiative of the individual operator - at least within the limits of a minimum standard of adequacy. In this way, the operator would be fully responsible for the amount of indebtedness incurred for improvements. He might choose to establish adequate but inexpensive farm buildings rather than assume a heavy debt for more expensive improvements in the beginning. A program for more comfortable homes for such families might be initiated later, when the land has been cleared and partially paid for, a balanced cropping system established, and the families' ambitions for improving their level of living developed.

Another important beneficial service to this group, and other more or less independent family-sized farm operators in the Delta, might be provided by some agency which would furnish machinery services at reasonable cost for such operations as seedbed preparation on heavy soils and the harvesting of small grains and hay crops. Without the advantages of such equipment small operators cannot grow certain crops and make the most profitable use of cropland not devoted to cotton. Some governmental or private agency might furnish such services on a custom basis at a reasonable rate, provided enough small operators would cooperate. Another possibility is the borrowing of funds to buy a unit of equipment by one farmer, who would do custom work for neighboring farmers. Similar projects have been developed among clients of the FSA whereby a loan is made to a "master borrower" who acquires a good sire and makes its services available to neighboring clients.

These programs would possibly be adequate for the more capable group of family operators, would require minimum funds and supervision, and would assist many families enough to allow them to become debt-free owners.

However, there is a group of families which must be considered in a program designed to foster family farms in this area. This group has a low financial status, and, in many instances, is not capable of handling managerial problems without assistance. These families are comparable to the cropper and wage-hand families on plantations; in fact, some of them have moved from plantations during recent years. They have acquired the habit of taking directions from plantation managers and are not accustomed to making decisions for themselves.

For this group of families, who cannot find places on plantations and do not have chances for other work, a very comprehensive program for rehabilitation would be required. A program which would afford as many as possible of the advantages of both family farms and plantations could be adopted. A plan which appears feasible would be one which establishes these families in a colony-type settlement with separately owned units operated under a resident manager, or as long-term tenants using the plantation system of operation. A Government-sponsored credit agency, such as the FSA, could take the initiative in organizing the project, buying the land, making the necessary improvements, and in providing management. Perhaps the plantation system of operation would be the most efficient, for the manager would then be able to utilize large-scale machinery for operations such as breaking, preparing seedbeds, harvesting small grains and hay crops. Unit boundaries could be ignored and the costs for certain operations could be pro-rated. The families would still do the chopping, picking, and other hand labor and would do most of the crop cultivation on their individual units. The charge for management and other services could be prorated to the individual families on the basis of crop acreage. In this way, many of the advantages of the plantation system, such as expert management, low interest and service costs, efficient buying and selling, and efficient use of heavy machinery to supplement mule power, could be provided.

The heavy machinery and equipment could be bought by the sponsoring credit agency and paid for by appropriate charges for custom work. Likewise good sires might be owned and used on the same basis. Facilities for assembling and marketing small quantities of surplus products from minor enterprises could be established. Instructions and encouragement in the growing of better gardens and producing more livestock products for home use could be given by the resident manager.

If Government programs are to encourage family farming in the Delta, the farms should be of sufficient size to provide at least a minimum level of living, to pay operating expenses, interest, and amortization costs, and to maintain the farm plant.

POSSIBILITIES OF INCREASED FARM POPULATION ON UNDEVELOPED LAND

The type and size of farm to be recommended for the Backwater Area depends upon whether the most important consideration is to provide a subsistence income to the greatest number of families, or to provide a more adequate cash income to fewer families who have all the acreage they can work efficiently under the best adapted combination of enterprises and organization.

Of the 591,000 acres classified as suitable for family cotton farms about 326,000 acres are already cleared (table 11). It was assumed that even with a comprehensive drainage system, 20 percent of the land would be left in woods either to provide fuel or because of the difficulty of draining. On this basis an additional 81,000 acres of the uncleared land are part of existing farms. Therefore only about 184,000 acres of land, that is classified as suitable for family-sized cotton farms, are available for settlement. This acreage would be adequate for about 4,600 two-mule cotton farms, (table 11), and would provide a larger labor income to the operators than is obtained by cropper and wage families on Delta plantations. However, about 147,000 acres of this land are between the 90- and 95-foot contours, and the land at the 90-foot level is marginal for family farms, unless it can be bought and improved at a very low cost per acre.

Because elevations are mapped by 5-foot contours only, it was impossible to determine accurately the area of land between the 90 and 92.5 foot elevations. Flood frequency and flood damages increase rapidly as elevation declines between 95 and 90 feet. Thus, although all this acreage was tentatively classed as suitable for family cotton farms, the acreage between the 90- and 92.5-foot elevations probably should be considered as marginal, requiring a low purchase and improvement cost per crop acre. Assuming a straight-line relationship between elevation and acreage, approximately half of the 147,000 acres between 90 and 95 feet should be placed in this category. If 73,600 acres are excluded for this reason, then only 110,000 acres regarded as suitable without reservations remain to be settled. This would reduce the number of potential new 40-acre cotton farms to about 2,758.

Table 11.- Suitability of land for various farming systems and number of families that would be involved under each, Yazoo Backwater Area 1/

A. Cleared and Uncleared Land by Soils and Elevations

Soils group	Elevation (Feet)							
	BELOW 90		90 - 95		OVER 95		TOTAL	
	Cleared	Uncleared	Cleared	Uncleared	Cleared	Uncleared	Cleared	Uncleared
	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres
A	4.7	3.0	21.2	5.7	41.4	2.4	67.3	11.1
B	.6	7.8	25.4	14.9	34.8	6.0	60.8	28.7
C	.5	1.1	41.9	14.4	67.5	11.1	109.9	26.6
D	4.4	75.2	32.0	142.4	61.6	68.5	98.0	286.1
E and F	4.1	59.4	20.4	181.5	25.8	30.6	50.3	271.5
G	.6	6.8	.4	.9	-	-	1.0	7.7
Total	14.9	153.3	141.3	359.8	231.1	118.6	387.3	631.7

B. Suitability of Land for Various Farming Systems

Soils group	Cleared	Uncleared	Estimated woodland on present farms 2/	Available for settlemen
	1,000 acres	1,000 acres	1,000 acres	1,000 acres
Suitable for two-mule cotton family farms				
A,B,C,D soils above 95' elevation	205.3	88.0	51.3	36.7
A,B,C,D soils 90' - 95' elevation	120.5	177.4	30.1	147.3
Total	325.8	265.4	81.4	184.0
Suitable for oats - soybean and cash grain-cotton family farms				
A,B,C,D soils above 95' elevation	205.3	88.0	51.3	36.7
E and F soils above 95' elevation	25.8	30.6	6.5	24.1
Total	231.1	118.6	57.8	60.8
Suitable for plantations				
A,B,C,D soils above 95' elevation	205.3	88.0	51.3	36.7
A,B,C,D soils 90' - 95' elevation	120.5	177.4	30.1	147.3
E and F soils above 95' elevation	25.8	30.6	6.5	24.1
Total	351.6	296.0	87.9	208.1
Not suitable for farming				
All soils below 90' elevation	14.9	153.3	-	-
E and F soils 90' - 95' elevation	20.4	181.5	-	-
G soils 90' - 95' elevation	.4	.9	-	-
Total	35.7	335.7	-	-

Continued -

Table 11.- Suitability of land for various farming systems and number of families that would be involved under each, Yazoo Backwater Area 1/ - Continued

C. Number of Farm Families Involved

Soils group	Land available for settlement	Farming systems						
		Family farms			Plantations			
		Two-mule cotton	Tractor-cash grain-cotton	Tractor oats-soybean	Cropper		Wage	
	1,000 acres	Families	Families	Families	Number	Families 3/	Number	Families 3/
A, B, C, D above 95' elevation	36.7	917	306	193	53	1,272	53	848
A, B, C, D 90' - 95' elevation	147.3	4/3,681	0	0	210	5,040	210	3,360
E and F above 95' elevation	24.1	0	201	127	34	816	34	544
Total	208.1	4,598	507	320	297	7,128	297	4,752

1/ Source: Unpublished data prepared by Bureau of Agricultural Economics.
2/ Estimated on basis of 80 percent cleared and 20 percent woodland on developed farms.
3/ Number of families refer to resident families on each plantation unit; some off-farm laborers will be required for picking cotton.
4/ From the 90' to 92.5' elevations suitability for family farms is contingent upon low prices for the land.

If a larger income per family than is obtained from a two-mule cotton farm is considered desirable, even though it reduces the number of potential settlers, then the 120-acre, mechanized cotton-cash grain, or 190-acre, mechanized cash-grain organizations are suggested. Of the 350,000 acres that are suitable for these mechanized family organizations, about 231,000 acres are now in cultivation, and an estimated 57,800 acres of the remaining uncleared land are in woodlots and undrainable sloughs and swamps within farm units. Thus, only about 60,300 acres of suitable land are still available for mechanized cotton-cash-grain and mechanized cash-grain units. This acreage would be adequate for about 507 of the 120-acre cotton-cash-grain family farms or about 320 of the 190-acre mechanized cash-grain units.

All the acreage suitable for these two organizations is also suitable for plantations. In addition, there are about 207,900 acres in the A, B, C, and D soils groups between the 90- and 95-foot contours, that are suitable only for family cotton farms or plantations. Thus there is a total of about 647,500 acres suitable for plantation units. Of this amount, about 351,600 are now in cultivation and about 87,900 acres of the woodland consist of woodlots and undrainable sloughs in existing farm units. This leaves a total of about 208,000 acres of uncleared land that are suitable for plantation units. Under a tenant plantation system, this acreage would support about 7,128 resident families, whereas with a wage plantation system, 4,752 resident families would be employed. In addition to the resident families, about 1,250 resident-family equivalents of outside labor would be required on wage plantations, and about 682 family equivalents on tenant plantations.

Thus all land available for settlement will provide for 4,598 two-mule cotton farms and 201 tractor-cash grain-cotton units, or a total of 4,799 units. On the other hand, this acreage used for tenant plantations will involve about 7,128 resident families and about 682 non-resident family equivalents. Under the wage plantation system, 4,752 resident families and 1,250 non-resident family equivalents would be involved.

APPENDIX

Table 12. - Normal yields of specified crops by soils groups, Yazoo Backwater Area 1/

Soils group	Cotton	Corn	Oats	Soybeans		Sorghum
				Hay	Seed	Forage
	Pound	Bushel	Bushel	Ton	Bushel	Ton
A	315	18	60	3	15	15
B	305	18	55	3	15	15
C	330	8	70	2-1/2	12	13
D (new)	345	30	55	2-1/2	12	12
D (old)	320	10	55	2-1/2	12	12
E (new)	345	20	65	2	10	10
E (old)	230	5	65	2	10	10

1/ Cotton yields are 5-year average AAA yields; other yields based on farm-management schedules and estimates of soils and agronomy specialists.

Table 13. - Damages to farm improvements, equipment, supplies, and cost of evacuation, resulting from floods, per acre of cropland, Yazoo Backwater Area 1/

Elevation	Annual flood frequency	Damages	
		Per flood	Per year
Feet	Years	Dollars	Dollars
85	1.3	0.02	0.02
87.5	1.5	.04	.03
90	1.8	.08	.04
92.5	3	.13	.04
95	5	.25	.05
97.5	9	.47	.05

1/ Adapted from unpublished reports of U. S. Army Engineers.

Table 14. - Average additional expenditures per acre of cotton and corn, required because of floods, family farms, Yazoo Backwater Area 1/

Elevation	Crop season flood frequency	Cotton		Corn		Cropland	
		Per flood	Per year	Per flood	Per year	Per flood	Per year
Feet	Years	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
85	1.6	0.86	0.54	1.40	0.88	0.90	0.57
87.5	1.9	.73	.38	1.39	.73	.85	.44
90	2.5	.75	.30	1.44	.58	.88	.35
92.5	4.5	2/ .02	0	1.30	.29	.53	.12
95	8.0	.74	.09	1.67	.21	.97	.12
97.5	15.0	.33	.02	1.70	.11	.81	.05

1/ Based on usual practices followed in cotton and corn production and the actual dates floods occurring during the period 1890-1939 would have reached various elevations, assuming 1939 levee and river channel improvements.

2/ The expenditures were unusually low at this elevation because floods occurred relatively early and over a narrow range in dates (April 2 to 16).

Table 15. - Reduction in yield per acre of cotton and corn, due to delayed planting, Yazoo Backwater Area

Date of planting	Corn		Seed cotton	
	Yield 1/	Reduction from maximum yield	Yield 2/	Reduction from maximum yield
	Bushels	Percent	Pounds	Percent
March 1	31.8	0	3/ —	—
March 15	31.5	1	3/ —	—
April 1	31.0	2	1,170	—
April 15	28.1	12	1,589	0
May 1	25.5	20	1,511	5
May 15	24.6	23	1,310	18
June 1	21.3	33	915	42
June 15	16.3	49	329	79
July 1	12.4	61	32	98
July 15	7.9	75	0	100

1/ 1929-39 yield data adapted from Mississippi Agricultural Experiment Station, Service Sheet No. 286, "Corn Production in the Yazoo-Mississippi Delta", 1940.

2/ 1929-37 yield data adapted from mimeographed circular of the Miss. Expt. Sta.

3/ No plantings before April 1.

Table 16. - Per acre reduction in net value of cotton and corn resulting from delayed planting, family farms, Yazoo Backwater Area

Soils group area	ELEVATION (FEET)											
	85		87.5		90		92.5		95		97.5	
	Per flood	Per year	Per flood	Per year	Per flood	Per year	Per flood	Per year	Per flood	Per year	Per flood	Per year
	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
					COTTON 1/							
A	17.97	11.23	16.00	8.42	14.58	5.83	9.72	2.16	8.64	1.08	4.80	0.32
B	17.39	10.87	15.48	8.15	14.10	5.64	9.40	2.09	8.40	1.05	4.65	.31
C	18.82	11.76	16.76	8.82	15.27	6.11	10.17	2.26	9.04	1.13	4.95	.33
D (new)	19.68	12.30	17.52	9.22	15.97	6.39	10.66	2.37	9.44	1.18	5.25	.35
D (old)	18.26	11.41	16.24	8.55	14.80	5.92	9.86	2.19	8.80	1.10	4.95	.33
E (new)	19.68	12.30	17.52	9.22	15.97	6.39	10.66	2.37	9.44	1.18	5.25	.35
E (old)	13.12	8.20	11.68	6.15	10.65	4.26	7.11	1.58	6.32	0.79	3.45	.23
					CORN 2/							
A	4.42	2.76	4.22	2.22	3.75	1.50	2.97	0.66	2.88	.36	1.80	.12
B	4.42	2.76	4.22	2.22	3.75	1.50	2.97	.66	2.88	.36	1.80	.12
C	1.97	1.23	1.88	0.99	1.68	0.67	1.35	.30	1.20	.15	.90	.06
D (new)	7.36	4.60	7.03	3.70	6.25	2.50	4.95	1.10	4.80	.60	3.00	.20
D (old)	2.45	1.53	2.34	1.23	2.08	.83	1.66	.37	1.60	.20	1.05	.07
E (new)	4.91	3.07	4.69	2.47	4.18	1.67	3.28	.73	3.20	.40	1.95	.13
E (old)	1.23	0.77	1.18	.62	1.05	.42	0.81	.18	0.80	.10	.45	.03

1/ Lint cotton is valued at 10 cents per pound and cotton seed at $20 per ton. Ginning charges of 1.2 cents per pound were deducted from the value of the cotton.

2/ Corn is valued at 60 cents per bushel.

Table 17. - Number and value 1/ of buildings, livestock, and machinery items on various family farm organizations, Yazoo Backwater Area

Item	One-mule farm		Two-mule farm		Tractor-cash-grain-cotton farm		Tractor-oat-soybean farm	
	Number	Dollars	Number	Dollars	Number	Dollars	Number	Dollar
Buildings:								
Dwelling	1	375	1	375	1	375	1	375
Barns and sheds	1	75	1	75	1	325	1	325
Other buildings, well and fence	—	50	—	50	—	50	—	50
Mule-drawn machinery:								
Turning plow	1	16	1	16	—	—	—	—
Middlebuster	1	21	1	21	—	—	—	—
Cotton-planter	1	22	1	22	—	—	—	—
Double shovel	1	6	1	6	—	—	—	—
One-mule cultivator	1	10	1	10	—	—	—	—
One-row cultivator	—	—	1	44	—	—	—	—
Miscellaneous	—	75	—	75	—	—	—	—
Tractor and tractor equipment:								
Tractor, 12 hp.	—	—	—	—	1	900	1	900
One-row middlebuster	—	—	—	—	1	50	1	50
Disk harrow-5'	—	—	—	—	1	98	1	98
Two-row planter	—	—	—	—	1	144	1	144
Two-row cultivator	—	—	—	—	1	135	1	135
One-bottom-pan plow	—	—	—	—	1	100	1	100
Combine-4'	—	—	—	—	1	475	1	475
Drill-8'	—	—	—	—	1	135	1	135
Truck	—	—	—	—	—	—	1	1,125
Tractor-trailer	—	—	—	—	1	150	—	—
Livestock:								
Mules	1	150	2	300	—	—	—	—
Dairy cows	1	30	1	30	1	30	1	30
Sows	1	10	1	10	1	10	1	10
Hens	35	28	35	28	35	28	35	28

1/ Estimated initial values.

Table 18. - Usual amounts of seed and fertilizer used per acre for various crops, Yazoo Backwater Area

Crop	Planting seed	Fertilizer
	Pounds	Pounds
Cotton	50	125
Corn	14	—
Oats	80	125
Soybeans:		
For seed	45	—
For hay	60	—
Soybeans interplanted in corn and turned over	15	—

Table 19. - Annual feed requirements per head of livestock, Yazoo Backwater Area

Item	Corn	Hay
	Bushels	Tons
Mules	50	2-1/4
Cows	10	1
Sows	20	—
Pigs	5	—
Hens	1/2	—

Table 20. - Operating and maintenance requirements for tractor, Yazoo Backwater Area

Item	Unit	12 hp. tractor A, B, and C soils	 D and E soils
Fuel	Gallons per 10-hour day	12	14
Oil	Quarts per 10-hour day	1	1
Grease	Pounds per 10-hour day	1/8	1/8
Repairs:			
Tractor and tractor equipment	Percentage of value new	5	6.3
Depreciation:			
Tractor and tractor equipment	Percentage of value new	12-1/2	15

Table 21. - Operating and maintenance data for truck, Yazoo Backwater Area

Item	Unit	
Miles per gallon of fuel	Number	12
Oil per 1,000 miles	Quarts	6
Grease jobs per 1,000 miles	Number	1
Repairs	Percentage of value new	6.7
Depreciation	Percentage of value new	15

Table 22. – Assumed prices of products sold, Yazoo Backwater Area

Item	Unit	Price per unit
		Dollars
Cotton lint	Pounds	0.10
Cottonseed	Ton	20.00
Corn	Bushel	.60
Soybean hay	Ton	9.00
Alfalfa hay	Ton	12.50
Oats	Bushel	.35
Soybeans	Bushel	.75
Calves	Head	8.00
Pigs	Head	3.00
Poultry	Head	.35
Eggs	Dozen	.17

Table 23. - Assumed current and overhead expenses, family farms, Yazoo Backwater Area

Item	Unit	Value
		Dollars
Materials and supplies:		
Fertilizer	Ton	32.00
Tractor gasoline	Gallon	.12
Tractor oil	do	.45
Tractor grease	Pound	.10
Truck gasoline	Gallon	.18
Truck oil	Quart	.30
Truck greasing	Job	.50
Planting seed: 1/		
Cotton	Ton	60.00
Oats	Bushel	.75
Soybeans	do	2.00
Garden	--	5.00
Feed:		
Corn	Bushel	.60
Services:		
Ginning 2/	Cwt. seed cotton	.30
Bagging and ties	Bale	1.50
Veterinary and other expenses	Mule	1.50
Hauling cotton	Bale	.50
Labor:		
Regular farm labor	Day	1.00
Picking	Cwt. seed cotton	.75
Interest on operative capital 3/	Dollar	.08
Taxes	Crop acre	1.33
Repairs:		Percent of value new
Dwelling		3.4
Barns and sheds		4.0
Other buildings and well		2.0
Depreciation:		
Dwelling		3-1/3
Barns and sheds		3-1/3
Other buildings and well		3-1/3

1/ All seed bought except 3/4 of cotton and 1/2 of oats. All soybean seed produced on tractor-oat-soybean farm.

2/ 1,500 pounds of seed cotton per bale of 500 pounds lint.

3/ Interest for 6-month period figured on furnish of $12 per month plus all operating expenses except bagging, ties, and ginning.

Table 24. - Usual yearly perquisites, family farms, Yazoo Backwater Area

Item	Unit	Number of units	Value per unit
			Dollars
House rent	—	1	36.00
Milk	Gallons	300	.15
Eggs	Dozen	125	.17
Poultry	Head	40	.30
Pork	Pounds, LW	600	.06
Corn	Bushels	15	.60
Irish potatoes	Bushels	7	.75
Sweetpotatoes	Bushels	20	.50
Peas or beans	Pounds	60	.05
Canned vegetables and fruits	Quarts	150	.10
Firewood	Cords	10	.50
Garden	—	1	25.00

Table 25. - Hours of man labor and power used per acre in producing various crops, family farms, Yazoo Backwater Area

Crop	Hours per acre		
	Man	Mule	Tractor
Cotton	155.8	40.9	—
Corn	42.0	38.0	—
Oats	8.9	—	4.8
Soybeans for seed	6.1	—	3.7
Soybeans for hay	25.6	33.2	—

Table 26. - Usual distribution, by months, of labor and power used per acre in producing various crops, family farms, Yazoo Backwater Area

Month	Cotton		Corn		Soybeans for hay		Soybeans for seed		Oats	
	Man labor	Mule work	Man labor	Mule work	Man labor	Mule work	Man labor	Tractor work	Man labor	Tractor work
	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours
January	.9	1.8	.6	1.2	.6	1.2	.3	.3	—	—
February	1.0	2.0	2.2	4.4	—	—	—	—	—	—
March	2.0	4.0	5.3	9.9	—	—	—	—	.4	.2
April	3.8	6.2	5.0	3.2	—	—	—	—	—	—
May	26.0	9.9	14.5	6.3	5.4	8.4	1.3	.7	—	—
June	18.5	8.5	2.5	2.5	5.3	8.3	.5	.5	4.5	1.0
July	10.3	2.8	—	—	—	—	.5	.5	—	—
August	9.8	—	—	—	12.4	11.5	—	—	—	—
September	41.5	—	—	—	—	—	—	—	4.0	4.0
October	29.0	—	10.0	6.7	—	—	—	—	1.0	.8
November	11.1	1.9	.6	1.2	.6	1.2	3.0	1.2	1.0	.8
December	1.9	3.8	1.3	2.6	1.3	2.6	.5	.5	—	—
Total	155.8	40.9	42.0	38.0	25.6	33.2	6.1	3.7	10.9	6.8